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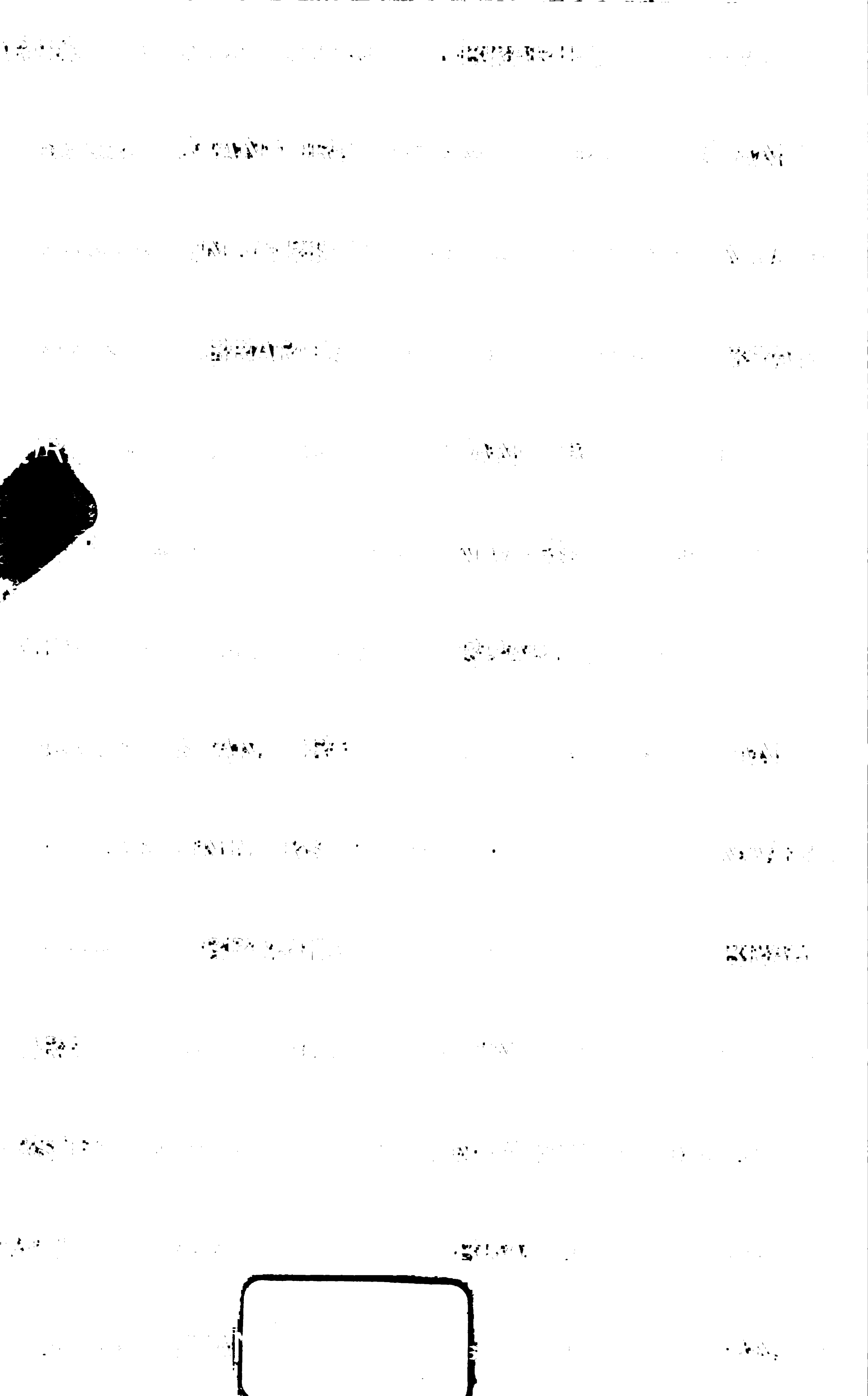
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THE INTERNATIONAL YEAR BOOK

A COMPENDIUM OF THE WORLD'S PROGRESS
IN EVERY DEPARTMENT OF HUMAN KNOWLEDGE
FOR THE YEAR

1898

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PREFACE. ---

IN the treatment of so eventful a year as 1898 the difficulty of compression into the compass of a single volume is very great. Were the volume given up to political affairs alone, it would still be hard to keep within bounds in treating of a year which has seen the downfall of Spain's colonial empire, the British conquest of the Soudan, the threatened clash of two great powers in Africa, the initial steps in the partition of China, the progress of one great railway project for opening up Asia and the development of another for spanning the entire African continent, the evacuation of Crete and of Greece, and the proposal of a peace conference by the very power whose attitude had hitherto seemed the most menacing. Selection is equally difficult in many other departments. The year has been a striking one in almost all lines of activity—in scientific discoveries and inventions, in literature and art, in industrial and commercial progress. In the department of biography the new names requiring notice in connection with important events of the year are very numerous; many persons already well known have added to their records; and the death roll includes such renowned names as Gladstone and Bismarck.

A brief survey of the most important events and lines of progress is the object of the present volume. The aim has been to arrange the subject-matter so far as possible in cyclopædic form, in order that the volume may serve not only as a Year Book, but as a supplement to, or continuation of, the principal cyclopædias. With this in view, the various topics have generally been treated under their own titles rather than grouped under more general heads, and the necessity of an index has been avoided. Single long articles, however, have been included on such subjects as Archæology, Anthropology, Botany, Philology, Physics, Astronomy, and Psychology, because in each of these cases the year's progress could be best exhibited by treating the subject as a whole; but wherever this has been done, care has been taken to supply cross-references from particular topics to the paragraphs of the longer articles in which they are treated. In general, wherever it seemed that the reader would more naturally turn to the particular topic than to the general subject of which it is a part, the article has been included under that title. Thus in the department of Medicine, such subjects as Serum Therapy, Typhoid Fever, Epidemic Influenza, Yellow Fever, Plague, etc., are treated under their own titles, and not as parts of a single long article on Medicine; and in the departments of Civil, Electrical and Mechanical Engineering, articles on Bridges, Canals, Automobiles, Electric Railways, Waterworks, Sewage Purification, etc., occur under those titles. This topical arrangement has also been found the most suitable in the departments of Geology, Mineralogy, Metallurgy, Biology, Zoology, Chemistry, and others, and it

is believed that as a result of this somewhat elastic arrangement the person who consults the volume will find the topics treated under the titles to which he would naturally turn first. The information in regard to universities and colleges, being almost wholly statistical in character, has been presented in an alphabetical table, under the title of Universities and Colleges, a comparatively small number of institutions being treated in separate articles. By this arrangement greater facility of reference has been secured, than if each college or university were treated by itself.

Another object which the authors of this volume have had in view has been to reflect the current discussion of the topics treated instead of giving a bare catalogue of events. Such discussion is as truly a part of the history of the year as the events themselves, and although the historical interpretation of events must be postponed for many years after their occurrence, a record of current opinion upon them has interest and value. For that reason, in treating such political topics as the colonial policy of the United States, the Fashoda affair, the Dreyfus case, the partition of China, the Behring Sea Dispute, the annexation of Hawaii, Currency Reform, the Nicaragua Canal, etc., and other matters which, like Hypnotism, Spiritualism, Christian Science, etc., have occasioned controversy, the purpose has been to present a fair statement of opposing views.

A work intended to fulfil the double office of a Year Book and a Cyclopædia appendix must necessarily include many lines of statistics, for no other department of a reference book falls so quickly behind the times. It is, perhaps, unnecessary to explain the inclusion of statistics in certain cases for years previous to 1898, since it is well known that many classes of statistics are not issued until long after the period of time to which they relate. It has been the aim of the editors in every case to include the latest figures which were available at the time of writing.

It will be noted in certain articles that the account of the year is preceded by a review of earlier aspects of the subject. In such cases it was thought that the reader would be spared some inconvenience if the article were made fairly complete in itself, instead of beginning abruptly with the year's record, without explanation or introduction.

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MAY 25, 1899.

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THE INTERNATIONAL YEAR BOOK 1898

ABBOTT, LYMAN, D. D., pastor of Plymouth Church, Brooklyn, New York, announced his resignation on November 27, 1898, to take effect March 1, 1899. This action was brought about by his inability longer to perform both the duties of pastor and of editor of the *Outlook*. The resignation was reluctantly accepted. He was born in Roxbury, Massachusetts, December 18, 1835; was graduated from the University of the City of New York in 1853, and after studying law took up theology and in 1860 was ordained a Congregational minister, settling at Terre Haute, Indiana. In 1887 he entered upon the pastorate of Plymouth Church, succeeding the late Henry Ward Beecher. Besides his constant church work, Dr. Abbott has issued a large number of publications and has had a wide experience in journalistic work; he was associated with Mr. Beecher in the editorship of the *Christian Union*, which became the *Outlook*, of which he is now editor-in-chief. To this work he hopes to devote much of his attention. Among his recent publications is the *Theology of an Evolutionist* (1897). Dr. Abbott's work in religious matters has been preëminently along scholarly and philosophical lines, his endeavor seeming to be to adjust a religious philosophy to practical life. As a preacher and especially as a thinker he is recognized among the foremost men of his day, and it is expected that his already wide influence will be augmented by concentration of his attention upon editorial work. Dr. Abbott's successor in Plymouth Church is the Rev. Newell Dwight Hillis, D. D., of Chicago.

ABERDEEN, Earl of. See CANADA.

ABRASIVES include buhrstones, grindstones, oilstones and whetstones, corundum and emery, infusorial earth and tripoli, garnet, quartz, crystal, pumice-stone and carborundum. All except the last mentioned are natural products. The value of the domestic production, and imports in 1897 was:

	Domestic Production.	Imports.
Buhrstones	\$ 25,932	\$ 22,956
Grindstones	368,058	49,496
Oilstones and whetstones.....	149,970	34,485
Corundum and emery.....	106,574	150,531
Infus. earth and tripoli.....	22,385	_____
Garnet	80,853	_____
Quartz crystal.....	22,500	_____
Carborundum	153,812	_____
Pumice	_____	\$65,930

ABYDOS. See ARCHÆOLOGY (paragraph Egypt).

ABYSSINIA occupies the eastern portion of Africa between the Italian colony of Eritrea on the north and British East Africa on the south.

Area and Population.—Abyssinia has an area, including its dependencies, of 150,000 square miles and an estimated population of 3,500,000. By a treaty in 1808 King Menelek ceded about 8,000 square miles of Somaliland to Great Britain. Abyssinia lays claim to an extensive tract of Somaliland north of British East Africa but the strip on the sea coast was ceded to Italy by the treaty of Adis Abeba. It is commonly forgotten that Abyssinia includes several distinct nations speaking different languages. It comprises the three large provinces Tigré on the north, Amhara on the south, and Shoa on the southeast. In the first named of these the Ethiopic tongue is spoken and in the other two the Amharic. There are many towns but none of them have a large population. The principal towns are Gondar, capital of Amhara; Adua or Adowa, capital of Tigré; and Adis Abeba capital of Shoa and the present residence of the emperor or king.

Racial Characteristics, Religion and Education.—The people are said to be of good physique and to have great powers of endurance. They are above the average height and show little if any resemblance to the other tribes of Africa. They are well fitted for long and difficult marches, being hardened by exercise in the climbing of their native mountains, and they make good soldiers. They are reputed to be treacherous and cruel, but these characteristics appear chiefly in their dealings with their foes, and to those with whom they are on friendly relations they often show the most loyal devotion. Education is confined to a few subjects and justice is administered in an exceedingly primitive way. The religion of the state is Christianity, the Abyssinian church being one of the oldest Christian churches in the world. At the head of the church is the Abuna, a Coptic Christian consecrated by the Patriarch of Alexandria in Egypt. Though educated in Egypt this dignitary must, on leaving that country, take an oath never to return.

Production.—Though a progressive people the Abyssinians have been restrained by the despotic government under which they live and have not made any great advance in the arts of civilization. Not much of the land is under tillage and the bulk of the people are hardly beyond the pastoral stage. The heavy taxation is one cause of the failure to cultivate the land to a higher degree. The soil is said to consist principally of black clay and to be well adapted to the growth of wheat, oats, barley, millet, and coffee. Coffee in fact grows wild in many parts of the country. Honey, beeswax, butter, aloes, sulphur, ebony, ox hides, ivory and civet musk are raised. Valuable woods are found in the forests and gold, copper, and iron are among the mineral resources. The trade is comparatively slight but includes the exportation of civet, coffee, wax, ivory and gold. The king controls the trade in these articles. The current coin has been the Maria Theresa dollar, but for this the Menelek dollar is being substituted as the standard coin.

History.—In the nineteenth century the advancement of the country has been chiefly due to the ability of the three emperors or kings, Theodore (1855-68), Johannes (1870-89), and Menelek, the present ruler (1898). Theodore was a man of great ability who appreciated the needs of his country. He tried to advance its prosperity and as a means to that end sought to obtain possession of a seaport. He was overthrown by England in 1868. Johannes, who was the prince of Tigré, then acquired the suzerain power and was crowned in 1872. His aims were rather more warlike than those of Theodore and he showed less statesmanship than the latter. On his death in 1889 Menelek, King of Shoa, came to the throne. Though parsimonious he has shown himself a man of ability, especially in his successful opposition to Italy, which has resulted in the recognition by that power of the complete independence of Abyssinia.

Foreign Relations.—The international relations of Abyssinia during recent years have been very important. It will be remembered that by the treaty of Uchali on May 2, 1889, King Menelek surrendered a considerable part of Abyssinian territory to the Italians, and acknowledged in effect an Italian protectorate over his country. The success of the Italians did not last long. On March 1, 1896, occurred the famous battle of Adowa, resulting in the complete defeat of the Italians, and a loss of 12,000 men, together with a large number of prisoners. Since this battle King Menelek has been engaged in many important diplomatic negotiations. The treaty of Adis Abeba, Oct. 26, 1896, surrendered a large tract of territory south of the Mareb, Belesa and Muna rivers, and recognized the complete independence of Abyssinia. Abyssinia now being left free to manage her foreign affairs, began to treat directly with foreign governments. In January 1897, France formed a commercial treaty with Menelek, and several French parties were sent out on diplomatic missions and tours of exploration. A French railroad was projected to Harrar. In the United States Consular Reports for March 1898, the consul at Adis Abeba writing under date of December 20, 1897, says that the proposed railroad from the principal seaport town of French Somaliland to the city of Harrar in Abyssinia, has reasonable assurance of success. The effect of this railroad is expected to be the development of commerce with Abyssinia, whose trade with the outside world has hitherto been of small ac-

count, the principal exports being gums, hides, coffee, skin, civet, ivory, beeswax and gold, and the imports cotton goods and petroleum. As these exports and imports have been transported by camel in caravans to the seaport towns of British and French Somaliland, trade has been greatly restricted. The resources of the country, however, are great, and no doubt the railroad will greatly develop it. About the close of 1897 the line was surveyed for a distance of about 186 miles. It was planned in the first place as a narrow gauge road, for which a broad gauge should be substituted if the project was successful. The laborers employed have been Somalis and Arabs, who are fitted to endure the intense heat of the country through which the railroad passes.

Treaty with Great Britain.—The English have also been recently engaged in negotiations with Abyssinia. The English interest in this region lay dormant for many years after the Mahdist revolt, and the unsuccessful campaign in the Soudan. It has been revived, however, since the Anglo-Egyptian expedition under Gen. Sir Herbert Kitchener started up the Nile with the purpose of regaining for England her lost provinces. England formally ceded Kassala to Abyssinia by treaty, June 3, 1884, but afterwards recognized the Italian protectorate over all Abyssinia, and transferred to her by special treaty the town of Kassala, with the understanding that it should be given back to Egypt. In December 1897, Kassala was restored to Egypt.

An English expedition under Mr. Rennell Rodd reached Adis Abeba on April 28, 1897. Its object was to renew diplomatic relations and to canvass the British claims in the upper Nile region, and the country of the White Nile. It was planned to form a commercial convention, and to secure coöperation of the King, or at least his neutrality, in the war against the Dervishes of the Soudan. King Menelek, who seems to have considerable diplomatic ability, was not disposed to acknowledge the British claims, and the treaty, which though signed by Menelek, May 14, 1897, was not published until February 1898, was disappointing to many Englishmen. The treaty consists of six articles, of which the first gives each party the right of trade and travel in the territory of the other. The second re-defines Abyssinian and British frontiers at the only point where they were already defined. The third declares the road from Zeila to Harrar open to both nations, while the fourth concedes to British trade the "most favored nation" treatment, and makes Zeila a free port of the Abyssinian state. The English object that these apparent commercial advantages are rendered almost wholly inoperative by a clause which prohibits any armed land, and therefore any properly defended caravan, from entering Abyssinia without previous authorization from the competent authorities. The fifth legalizes the importation of arms into Abyssinia across British territory, and the last proclaims the hostility of the King to the Mahdists. The last article was really no concession, because the Abyssinians being Christians are naturally hostile to the Mohammedan Mahdists. In exchange for these two concessions concerning trade and the Mahdists, England concedes a considerable tract of Somaliland, which is said to have been unfair to the hitherto loyal Somalis, but does not end the Abyssinian claims to the territory around Lake Albert and the right bank of the Nile. The treaty does not secure the political alliance that would be useful to England in her operations on the upper Nile and in eastern Soudan.

Russia, too, has been active in efforts to extend her influence in Abyssinia. There have been several Russian expeditions. In 1895 a party of Abyssinian dignitaries visited St. Petersburg, and in 1897 prominent Russians visited Abyssinia.

Relations with Italy.—The Italian prisoners began to return to Italy in the beginning of January 1897. According to the terms of the treaty of Adis Abeba, all points at issue between the Italian and Abyssinian governments had to be settled within a year of the date of that treaty, October 26, 1896. One point which proved difficult at first to adjust, was the matter of ransom. King Menelek demanded 20,000,000 lire, but afterwards reduced the amount by one half, while at the same time he became more exacting in regard to the frontier. The Italian commissioner for the delimitation of the frontier was Major Nerazzini, and a survey of the region was begun in 1897. King Menelek and the Italian envoy could not agree upon the boundary, and the negotiations lasted a long time. After the battle of Adowa, King Menelek was willing that the river Mareb should mark the frontier, but as time went on, he insisted on another boundary. The Italian government seemed somewhat in doubt as to the proper course to pursue. The Radicals demanded the entire abandonment of the Italian claims in eastern Africa. The majority were opposed to this, but there seemed to be a feeling of uncertainty in the minds of many as to whether it was wise to aim at a wide tract of territory unless the colony was sure to be self-supporting. The Italian envoy concluded with King Menelek a commercial treaty granting freedom of trade and travel to Italian citizens, and among other privileges Italy secured the right to have a permanent representative at the Abyssinian court.

King Menelek, who came to the throne in 1889, and whose capital is at Adis Abeba, is a shrewd, parsimonious man of no mean ability, and is greatly influenced by his clever wife, Ta-hai-itu. He calls himself "King of Kings of Ethiopia," and is dominant chief of a confederation of unrelated tribes, held together by force. His claims embrace a far wider tract of territory than the foreign powers will be willing to acknowledge. This territory stretches from 14 degrees to 2 degrees, north latitude. Its frontiers can best be traced on the map. (See Map of Africa.) England has accepted these frontiers provisionally.

ACADEMIE DE MEDECINE, Paris, *Rue des Saints-Pères, 49*, meets every Tuesday. This institution was founded in 1820 by an ordinance of Louis XVIII to supplant the *Académie Royale de Chirurgie* and *La Société Royale de Médecine* suppressed in 1793. It has served as a model for various medical associations in France and in other countries. The discussions of the *Académie* are published every week in a special *Bulletin*, and important essays in *Mémoires de l'Académie de Médecine*. There are 77 members.

ACADEMIE DES BEAUX ARTS, an outgrowth of the *Académie de Peinture* founded in 1648, *Académie Royale de Peinture et Sculpture*, and *Académie Royale d'Architecture*, is one of the five Societies of *L'Institut de France*. It is composed of five sections: painting, sculpture, architecture, engraving, and musical composition. On its roll of members are many of the most noted names of France.

ACADEMIE DES INSCRIPTONS ET BELLES LETTRES, founded in Paris in 1663 by four members of the *Académie Française*. It is one of the five societies of the *Institut de France* (q. v.).

ACADEMIE DES SCIENCES MORALES ET POLITIQUES, founded in Paris about 1720. It is one of the five societies belonging to the *Institut de France* (q. v.). It is composed of five sections.

ACADEMIE DES SCIENCES, founded in Paris by Colbert in 1666. It is one of the five societies of the *Institut de France* (q. v.). It is composed of 11 sections.

ACADEMIE FRANCAISE (French Academy), founded in 1629, by Cardinal Richelieu, consists of 40 members (the "forty immortals") and meets at the Palais de l'Institut every Thursday. The members now, with the dates of their election, are: Legouvé 1855; Duc de Broglie, 1862; Emile Ollivier, 1870; Alfred Mézires, 1874; Gaston Boissier, 1876; V. Sardou, 1877; Duc d'Audiffret Pasquier, 1878; Rousse, 1880; Sully-Prudhomme, 1881; Cherbuliez, 1881; Perraud, 1882; E. Pailleron, 1882; F. Coppée, 1884; Joseph Bertrand, 1884; Halévy, 1884; Edouard Hervé, 1886; V. Gérard, 1886; Comte d'Haussonville, 1886; Jules Clarétie, 1888; Melchior de Vogüé, 1888; De Freycinet, 1890; J. Viaud (Pierre Loti), 1891; E. Lavisse, 1892; Dangein, 1893; H. de Bornier, 1893; Brunetière, 1893; A. Sorel, 1894; Paul Bourget, 1894; De Hérédia, 1894; H. Houssaye, 1895; J. Lemaitre, 1895; Anatole France, 1896; Marquis Costa de Beauregard, 1896; Gaston Paris, 1896; Theuriet, 1896; Vandal, 1896; Hanotaux, 1897; De Mun, 1897; E. Guillaume, 1898. The fortieth chair is vacant. Secretary, Gaston Boissier.

Twenty-one "*prix littéraires*," and forty "*prix de vertu*" are awarded by the academy annually. Six members are appointed as a Dictionary Commission.

ACADEMY OF ARTS, (*Akademie der Künste*), Berlin, Unter den Linten, 38, founded in 1699, reorganized in 1882, has a section for painting and a section for music. Of the first, Prof. H. Ende is head, and of the second, Prof. Blummer. The Emperor is Protector of the institution. There are five honorary members, among them the Empress Frederik.

ACADEMY OF LISBON, was the outgrowth of the Academy of Portuguese History, founded in 1720 at Lisbon, by John V. In 1779 Queen Marie added an Academy of sciences, agriculture, arts, commerce, and economy. This, reorganized in 1851, is called *Academia real das Sciencias*. It has two classes: the first for science, the second for literature, history, politics, and social science. Since 1779 it has published memoirs of Portuguese history and other works of importance.

ACADEMY OF NATURAL SCIENCES, Philadelphia, founded in 1812, has a valuable scientific library and a very fine collection of natural history specimens, particularly birds.

ACADEMY OF POLITICAL AND SOCIAL SCIENCE, AMERICAN, founded in 1889, has 2,175 members. President, Edmund J. James, University of Chicago; Secretary, H. R. Seager, University of Pennsylvania. See SOCIOLOGY.

ACADEMY OF RAILWAY SURGEONS, AMERICAN, organized in 1894. Next annual meeting in October, 1899, at Omaha, Neb. President, W. W. Grant, M. D., Denver, Colo.; Secretary, T. B. Lacey, Council Bluffs, Iowa.

ACADEMY OF SCIENCES, NATIONAL. See NATIONAL ACADEMY OF SCIENCES.

ACADEMY OF SCIENCES, (*Akademie der Wissenschaften*,) Berlin, Unter den Linden, 38, founded in 1700 by Leibnitz, that great example of universal scholarship, for the "contemplation, the observation of the works and marvels of God in nature, description of discoveries and inventions, works of art, etc., in general all kinds of worthy studies and social culture contributing to the public good, the exercise of virtue, the propagation of truth, and the glorification of the divinity." New laws were made in 1881. The Protector is the Emperor.

ACADEMY OF SCIENCES, Munich, (*Akademie der Wissenschaften*) founded in 1759, is one of the most esteemed academies of the second class. It was recognized in 1809 and in 1829 was divided into three classes: philosophy and philology, mathematics and physics, and history. President Dr. von Pettenkofer.

ACADEMY OF SCIENCES, VIENNA. See ROYAL ACADEMY OF VIENNA.

ACADEMY OF MEDICINE, AMERICAN, organized September 1876. The membership consists of Fellows and Honorary members. The Fellows must have pursued a collegiate course preparatory to studying medicine. Next annual meeting, Columbus, O., June 3-5, 1899. President, Edward Jackson, M. D., Denver, Col.; Secretary, Charles McIntyre, M. D., Easton, Pa.

ACCUMULATORS. These are quite frequently called secondary batteries and sometimes storage batteries. They are voltaic cells in which the means for the development of chemical action is nominally present, but is not active unless so rendered by a chemical alteration, produced by an electric current. The term storage battery which has the sanction of long usage is incorrect since there is absolutely no storage of electricity in the cell. Briefly, an accumulator cell is a battery in which oxidizable metals are used as electrodes, the whole receiving electrical energy at one time and place to give it out at some other time and place.

The discovery of secondary currents is attributed to Gautherot, who, about 1801 while experimenting on the electrolysis of salt water between platinum and silver electrodes noticed a reverse current upon accidentally closing his voltameter circuit. Others started from this fundamental discovery and endeavored to put it to practical use. Among these later experimenters were Ritter, Volta, Davy and a number of others. In 1854 Sinsteden conceived the idea of using oxidizable metals as electrodes to obtain currents of practical magnitude. About 1860 Gaston Planté constructed the first useful secondary battery by immersing lead plates in dilute sulphuric acid. He followed this up with a long series of experiments and produced a really successful secondary battery. As Planté left the accumulator it consisted of two sets of lead plates held apart and immersed in an acid solution consisting of about 90 per cent. water and 10 per cent. sulphuric acid.

Unfortunately these plates had to be "formed," that is, the cell must be alternately charged and discharged for a period of several weeks before it is in working condition. To do this one set of plates is connected with the positive side of some source of electricity and the other set with the negative side. The acidulated water is decomposed, lead peroxide (PbO_2) forming on the positive plate, while the hydrogen is precipitated upon the negative plate without attacking the metal, as a film of gas. This forms a gas battery with the positive electrode composed of lead plates with an insoluble lead peroxide coating and the negative electrode composed of similar lead plates coated with a film of hydrogen. When a circuit is completed through the cell and it is used to produce a current, the hydrogen is oxidized and converted into water, some of the subjacent lead being oxidized at the expense of the water. The peroxide on the other plate is deoxidized or reduced to metallic lead in a spongy form.

In 1879 Mr. Charles F. Brush of Cleveland, Ohio, suggested the covering of lead grids or honeycomb plates with oxides of the same material which could be readily reduced to the ultimate products of formation in the Planté cell. About the same time (1881) Camille Faure in France constructed a cell after the same manner and as a result there has been much litigation which is to some extent responsible for the slow development and adoption of such batteries.

All accumulators may for the sake of classification be included under the following heads:

I. *Planté type*, accumulators having lead electrodes in which the

- (a) Electrodes are lead plates, wires or granulated lead.
- (b) Electrodes are spongy, porous or crystalline lead.
- (c) Electrodes are of amalgamated lead.

II. *Brush-Faure type*, accumulators having supports containing or covered with non-electrolytic lead oxide.

III. *Bimetallic*, accumulators having the positive electrode usually of lead and the negative electrode of zinc, copper, etc.

IV. *All other forms.*

Since the capacity of a cell is limited by the superficial area of the active portion of the electrodes, other things being equal, a large variety of forms of plates have been devised in the case of the Planté type to meet this requirement. Thus some forms have perforated plates, others are filled with pockets made of wire ribbon, etc. With the Brush-Faure type the same is true and in their formation the perforations or opening of the lateral grids are filled, usually under pressure, with paste made by mixing oxides of lead with sulphuric acid, minimum (Pb_3O_4) being used for the positive grid or electrode and litharge (PbO) for the negative. These cells have to be "formed" also, but the time required is markedly less than with the old forms. In the forming, the minimum is converted to lead peroxide (PbO_2) and the litharge to spongy lead of Pb. Another form of cell now quite generally used, employs pure lead as the active material, which is obtained by fusing together the chlorides of lead and zinc. The alloy thus formed is cast into small buttons, square for the negative and round for the positive, a dovetailed groove is made around their circumference, and they are then put in dilute hydrochloric acid, to remove the chloride of zinc, are dried, arranged symmetrically on a flat surface and a frame of antimonious lead is cast about them. Previous to forming, the plates are placed in a bath of dilute chloride of zinc, with alternate plates of zinc, thus forming a short circuited primary battery, until the buttons are reduced to extremely porous metallic lead; the pores being normal to the surface of the plate. Negative plates are left finished ready for use by this operation, while the positives are immersed in dilute sulphuric acid and are charged from a dynamo for two weeks. The spongy lead is thus changed to lead peroxide.

The main troubles to which accumulators are as a rule liable are: "Disintegration" of the active material of the positive plate, "buckling" or warping of the plates, "sulphating" or the formation of white sulphate of lead over the surface of the plates, "short circuiting in part," due to pieces of the paste falling between plates, cracking of jars and the destructive effect of the acid electrolyte upon surrounding objects.

The quantities that must be regarded in the use of accumulators are:

(1) *Electromotive Force*.—The normal maximum voltage in charging should be from 2.4 to 2.5 volts and the minimum to which the secondary batteries should be discharged is from 1.85 to 1.9 volts. It is necessary in charging to have a slightly higher voltage than that of discharge to overcome the internal resistance and leakage of the cell. The density of the electrolyte gradually rises during charging to about 0.05 that of the discharge density.

(2) *Current*.—The amount of charging or discharging current may be varied within certain limits to suit the operator, but manufacturers usually state the best for charging or the maximum safe discharging rate. This is usually expressed in amperes per unit of plate area or per unit weight.

(3) *Resistance*.—Meaning internal resistance of the cells, is always low and generally variable. It depends upon the density of electrolyte, the area and distance between plates and the temperature.

(4) *Capacity*.—This is the quantity of electricity the cell can yield on discharging; it is variable even in the same cell at different times.

(5) *Efficiency*.—This is of two kinds, the "ampere efficiency" or the ampere-hours obtained from the battery, divided by the ampere-hours put into it, and the real or "watt efficiency" obtained by including the voltage as well as the ampere-hours. This is the commercial efficiency and indicates the ratio between the total work done by the cell and the work done in charging the cell. The latter ranges from 82 per cent. to 85 per cent., and the former from 91 per cent. to 97 per cent., but for average commercial work 75 per cent. is nearer the true figure. Depreciation is considerable even under favorable conditions and an allowance of 10 per cent. per annum for actual deterioration, not including interest or taxes, is not excessive.

Uses to which accumulators are put.—To supply portable lamps; to take up fluctuations on lighting circuits and thus steady the voltage and to furnish energy during certain hours of the day or night to enable machinery to be stopped; to aid the generating station in carrying the heavier load which usually exists on the station for only one or two hours; to make the load on the engines more uniform by charging the battery when the load is light; to transform from a higher to a lower potential by charging the cells in series and discharging in parallel or vice versa; to subdivide the voltage, and enable a three or five wire system to be operated by a single dynamo; to supply current from local centers or substations; to run street cars, launches, electric vehicles, and for the operation of portable machinery.

These different uses have required the development of two different types of accumulators: first, the large heavy cell for central station work, with an output ranging from less than 100 amperes for eight hours, or 200 amperes for three hours, to from 2480 amperes for eight hours to 4960 amperes for three hours, giving 1.71 ampere-hours capacity for every pound of complete cell. Second, a light compact

one for portable work, such as launch propulsion and the operation of electric vehicles, which is given in the following table:

Number of plates $5\frac{3}{8} \times 7\frac{5}{8}$ in.	5	7	9	11	13	15
Discharge in amperes for 4 hrs.	15	$22\frac{1}{2}$	30	$37\frac{1}{2}$	45	$52\frac{1}{2}$
Weight of element in lbs.,	14	$19\frac{1}{4}$	$26\frac{1}{2}$	$30\frac{1}{4}$	39	$47\frac{1}{2}$
Outside measure- ment of rubber jars in inches, .	Width,	$2\frac{7}{8}$	$3\frac{1}{4}$	$4\frac{7}{8}$	$5\frac{1}{8}$	$6\frac{7}{8}$
	Length,	$6\frac{1}{8}$	$6\frac{1}{8}$	$6\frac{1}{8}$	$6\frac{1}{8}$	$6\frac{1}{4}$
	Height,	$10\frac{3}{8}$	$11\frac{1}{2}$	$11\frac{1}{2}$	$11\frac{1}{2}$	$11\frac{1}{8}$
Weight of acid in lbs.,	$3\frac{1}{4}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{4}$	$8\frac{1}{4}$
Weight of complete cell in lbs.,	$18\frac{1}{4}$	$25\frac{1}{2}$	$33\frac{1}{2}$	$38\frac{3}{4}$	49	$58\frac{3}{4}$
Height of cell over top of pillar in inches	$11\frac{1}{4}$	12	12	12	$12\frac{1}{8}$	$12\frac{1}{8}$

or an ampere-hour capacity of 4.08 per pound of cell in the smaller and 4.47 ampere-hours per pound in the larger size. It is this type of cell which has within the past year given such excellent service for electric vehicles in New York City and elsewhere. See AUTOMOBILES.

ACETYLENE PURIFICATION. Acetylene, prepared with commercial calcium carbide, is contaminated with notable quantities of hydrogen sulphide and hydrogen phosphide. Both these impurities may be removed by passing the gas through bromine water. This reagent, however, becomes exhausted rapidly, is capable of regeneration, and converts part of the acetylene into bromine derivatives. The hydrogen sulphide is best removed by means of caustic soda solution, and hydrogen phosphide by subsequently passing the gas through a solution of mercuric chloride acidified with hydrochloric acid, or through nitric acid containing a small quantity of a salt of copper or iron in solution. The precipitate produced in the mercuric chloride solution may be collected and dissolved in nitric acid.

ACLAND, SIR THOMAS DYKE, M. A., D. C. L., eleventh baronet, died May 20, 1898. He was born May 25, 1809, was educated at Harrow and at Christ Church, Oxford, subsequently becoming a fellow of All Souls. From 1837 to 1847 he was member of Parliament for West Somerset; for North Devon, 1865-85, and again for West Somerset in 1885-86. He published: A prize essay on *Farming of Somerset; Chemistry of Farming* (1894); *Knowledge, Duty and Faith* (1896).

ACTORS' FUND OF AMERICA, established in 1882 to aid needy actors and pay the expenses of burial when necessary. Contributions from organization to the present equal \$550,000, and \$350,000 has been expended. In June 1898, the fund was \$196,615, the annual members were 862 and life members 118. There are twenty honorary members, including ex-President Cleveland, Chauncey M. Depew, Robert J. Ingersoll, and Ignace J. Paderewski. Officers (1899): Lewis Aldrich, President; Frank W. Sanger and John Drew, Vice-Presidents; Andrew A. McCormick, Treasurer; Edwin Knowles and Adolph Bernard, secretaries; and Antonio Pastor, Augustus Pitou, A. M. Palmer, William E. Sinn, Harrison Grey Fiske, T. Henry French, William H. Crane, F. F. Mackay, William A. Brady, DeWolf Hopper, Francis Wilson, Roland Reed, Charles H. Hoyt, Eugene Tompkins, B. F. Keith and Frank G. Cotter.

ACTORS' SOCIETY OF AMERICA, organized in 1894, consists of 1,200

members. F. F. Mackay, President; William F. Burroughs, Secretary. Headquarters 131 W. 40th st., New York.

ACTUARIAL SOCIETY OF AMERICA, organized in 1889, to promote the science of life insurance, has 205 members. President, Bloomfield J. Miller; Secretary, Israel C. Pierson, 141 Broadway, New York.

ADEN. See **ARABIA**.

ADIS ABEBA, the capital of Shoa in the kingdom of Abyssinia. It was here that the treaty was concluded between Italy and the King Menelek on October 26, 1896, after the crushing defeat that the Italian army had suffered near Adowa. By this treaty Abyssinia regained the entire district to the south of the rivers Mareb, Belesa and Muna, and was recognized as an independent kingdom. The population of Adis Abeba is estimated at 3,000.

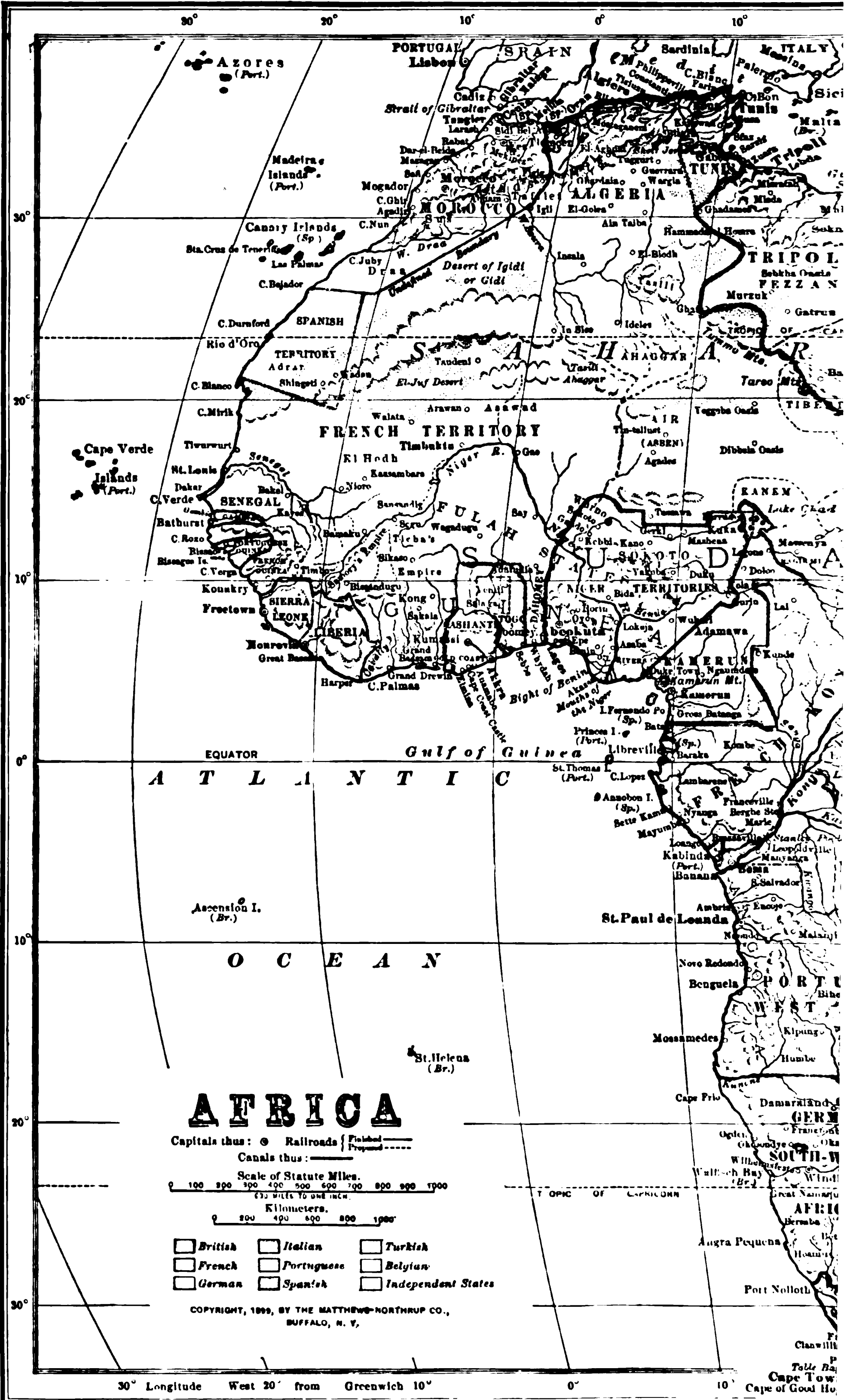
ADVENTISTS comprise (1898): I. Evangelical, with 34 ministers, 30 churches, and 1,147 members; II. Advent Christian, with 912 ministers; 610 churches, and 26,500 members; III. Seventh Day (see **ADVENTISTS, SEVENTH DAY**); IV. Church of God, with 19 ministers, 29 churches, and 647 members; V. Life and Advent Union, with 60 ministers, 28 churches, and 3,000 members, and VI. Churches of God in Jesus Christ, with 94 ministers, 95 churches, and 2,872 members.

ADVENTISTS, SEVENTH DAY, were organized about 1844. The most noteworthy event of 1898 was a general meeting at Hapsburg, Germany, in July, when thirteen nationalities were represented, and the European Union Conference, with Elder O. A. Olsen as president, was organized. The German conference (45 churches and 1,500 members) was also organized. The British Conference (900 members) was also organized at Bath, England, in July 1898. In the past year 42 state and general and more than 400 camp-meetings were held in the United States, Canada, Europe, South Africa, and South America. Altogether 102 missionaries were sent out; the tithe to the General Conference increased over \$18,000 and 12 medical mission and rescue homes were established in the United States. There are now 428 ordained ministers; 260 licentiates; 1,403 churches, or organizations; 50,288 members, and three colleges, with 31 instructors, and 266 students. The church property is valued at \$645,075.

AËRIAL NAVIGATION. Great progress has been made in recent years in the art of aërial navigation. In 1894 Hiram S. Maxim read before the British Association at Oxford a paper describing an experiment he had made with a flying machine which he claimed to be the first machine that was really practicable. In June 1898, a new method was explained by Mr. Davidson before the Aëronautical Society in England. This method involved the use of rotary fans to lift the machine, which was provided with large wing surfaces. In the United States the sum of \$25,000 has been appropriated by the Board of Ordnance and Fortification for experimenting with flying machines for military purposes. In France some important experiments were made on September 20, 1898, and a balloon invented by M. De Santos-Dumont reached a height of 1,300 feet. Its course was said to be easily controlled.

AFGHANISTAN, a country of Central Asia with an area of about 300,000 sq. m. and a population variously estimated at from 4,000,000 to 16,000,000. Since 1893 the trade of Cabul and India has declined. At present the chief articles imported are cotton goods, indigo, sugar and tea, and the exports include horses, spices, asa-fœtida, fruits and nuts. Only a part of the country is allowed to participate in the trade for the heavy transit duties levied by the Ameer prohibit trade between India and the country north of the river Oxus. There is an important trade, however, with Kandahar and Bokhara. It is said that the northern part of Afghanistan is rich in copper. Lead, a good quality of iron and a small quantity of gold are found in some parts of the country. A variety of tribes occupy Afghanistan, the most numerous being the Ghilzais, who number about one-fourth of the 4,000,000 subjects of the Ameer. Other tribes are the Tajiks who are scattered throughout the country and besides these the Duranis, Hazaras, Aimaks and Uzbegs. Adequate statistics in regard to the country are hard to procure. The revenue is said to have increased in recent years, and the Ameer, Abdurrahman, is able to support a considerable standing army. In 1896 it was estimated that on a war footing this army was 50,000 strong. See article **INDIA** (paragraphs on History).

AFRICA. When we bear in mind the fact that less than fifty years ago the map of the center of Africa was for the most part a blank, it is almost impossible to believe that discovery has accomplished so much. The work begun by Livingstone fifty years ago and continued by Burton, Speke, Stanley, Thompson and many others has opened up the interior of the entire country. Yet the greater part of this region is traversed only by explorers' trails and has not been accurately surveyed. And between the routes of explorers there are wide gaps of which little is known. The region to the west and northwest of Lake Rudolf on the east of the Nile is wholly



AFRICA

Capitals thus: ● Railroads { Finished ——— Proposed - - - - -
Canals thus: ———

Scale of Statute Miles.
0 100 200 300 400 500 600 700 800 900 1000
630 Miles to one inch.

Kilometers.
0 200 400 600 800 1000

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|----------------------------------|-------------------------------------|---|
| <input type="checkbox"/> British | <input type="checkbox"/> Italian | <input type="checkbox"/> Turkish |
| <input type="checkbox"/> French | <input type="checkbox"/> Portuguese | <input type="checkbox"/> Belgian |
| <input type="checkbox"/> German | <input type="checkbox"/> Spanish | <input type="checkbox"/> Independent States |

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30° Longitude West 20° from Greenwich 10° 0° 10° Cape Town Cape of Good Hope



unexplored and in the western and eastern Sahara there are good fields for further explorations.

But whether explored or not the lands of Africa are at present almost all apportioned with some degree of definiteness as European colonies or native states. This has been almost wholly the work of the present century. In 1798 the knowledge of Africa was limited to Cape Colony in the south and to the Mediterranean countries in the north. Two explorers, Bruce and Mungo Park, to be sure, had visited the Blue Nile and Timbuctoo, respectively, but inner Africa remained an unknown land down to the time of those discoveries which began with Livingstone's journeys to the Zambesi in 1854-1857. This so-called scramble for African possessions did not begin in earnest until September 1884, when Germany having appeared on the coast of southwest Africa and claimed a share, the Berlin Conference was assembled to lay down the rules which should govern European acquisitions and to recognize the new Congo Free State under the sovereignty of the Belgians. From 1884 to 1898 the scramble for African territories has continued with the result that the attention of the whole world is drawn to that continent as the seat of a mighty contest of national claims which at any time may draw the great powers of Europe into war.

The following list shows how far the territories of Africa have been apportioned among the nations of the world:—

INDEPENDENT STATES.....	{	Abyssinia.
		Congo Free State.
		Liberia.
		Morocco.
		Orange Free State.
		Tripoli.
		Ascension Island.
		Basutoland.
		Bechuanaland Protectorate.
		Cape Colony.
		Central Africa (British).
		Central Africa Protectorate (British).
		Mashonaland.
		Matabeleland.
		East Africa (British).
BRITISH.....	{	Zanzibar.
		Mauritius.
		Natal.
		Niger Coast Protectorate.
		Niger Territories.
		St. Helena.
		Tristan da Cunha.
		Gold Coast.
		Lagos.
		Gambia.
		Sierra Leone.
		Somali Coast Protectorate.
		Uganda.
		Walvisch Bay.
		Zululand.
UNDER BRITISH INFLUENCE..	{	Egypt.
		The Egyptian Soudan.
		Transvaal.
		Algeria.
		French Congo.
FRENCH.....	{	French Guinea.
		Madagascar.
		Diego-Suarez, Nossi-Bé, and St. Marie.
		Mayotte and the Comoro Island.
		Réunion.
		Obock.
		Senegal.
		French Soudan.
		Dahomey.
		Tunis.
GERMAN.....	{	Cameroon.
		German East Africa.
		German Southwest Africa.
		Togoland.

ITALIAN.....	{	Eritrea.
		Somaliland.
PORTUGUESE.....	{	Angola.
		Cape Verde Islands.
		Guinea.
		Portuguese East Africa.

The Partition of Africa.—The general results of the partition of Africa down to 1898 are shown in the following list of the areas belonging to or claimed by the European States or still regarded as independent, according to the estimates of J. Scott Keltie, Secretary of the Royal Geographical Society:

France.....	3,300,000	square miles
Great Britain.....	2,300,000	" "
Germany.....	925,000	" "
Congo Free State.....	900,000	" "
Portugal.....	750,000	" "
Italy (including Somaliland).....	420,000	" "
Spain.....	214,000	" "
Boer Republics.....	168,000	" "
Abyssinia.....	195,000	" "
Morocco.....	220,000	" "
Liberia.....	14,600	" "
Turkey (Egypt, including regained territories on the upper Nile) and Tripoli.....	800,000	" "
Mahdi's territories.....	650,000	" "
Wadai.....	150,000	" "
Unannexed Sahara.....	800,000	" "
Lakes.....	68,000	" "
Total Africa.....	11,874,600	square miles

While the description of the different divisions of Africa in the present work will be given in detail under their own heads, it will serve as a general introduction of the subject to give a brief outline of the progress of the powers in the partition of Africa since the Berlin Congress of 1884-85.

The British Colonies in Africa.—To begin with the southernmost point of Africa, it will be seen that Great Britain holds that end of the continent and that her territory extends due north for a distance of 1,800 miles from Cape Town to Lake Tanganyika, her dominions being bounded on the west by German Southwest Africa, the Portuguese territory of Angola, and the Congo Free State; and on the east by Portuguese East Africa and German East Africa, while to the north of Cape Colony and surrounded on three sides by British territory lies the Orange Free State, and to the north of that the other Boer republic called the South African Republic. In this region Great Britain's boundaries are fixed with the exception of the dividing line between British South Africa and Portuguese Angola, Great Britain and Portugal both laying claim to a strip of land lying to the west of the Zambesi. Nearly a million of square miles are included in this tract of British territory and the colonies which constitute it are at different stages of administrative development, ranging from self-governing divisions like Cape Colony to protectorates and spheres of influence. British Bechuanaland, a protectorate, lies to the north of Cape Colony, but beyond this and further to the north is the far wider tract belonging to the British South Africa Company, while between the northern limit of this region and the southernmost point of Lake Tanganyika is the British Central African Protectorate, which is directly under imperial administration. Passing up Lake Tanganyika on the west side of German East Africa, and following the boundary between the latter colony and the Congo Free State for a distance of some 120 miles, we come to the southwest corner of another extensive British tract, known as British East Africa, part of which, namely this same southwest portion lying on the shore of Lake Tanganyika, forms the dependent kingdom of Uganda. The northwestern portion of British East Africa extends far to the west of the White Nile and includes, according to the British claims, the district of Bahr-el-Ghazal, about which much has been said on account of the French demands in connection with the occupation of Fashoda. With the islands of Zanzibar and Pemba, the area of this region is about 800,000 square miles. Its limits have been determined by agreements with Germany and Italy. British East Africa is bounded on the east by Abyssinia and Somaliland and on the south by German East Africa. Great Britain also possesses a considerable tract of territory on the Gulf of Aden with an area of about 75,000 square miles. This completes the list of her possessions in Eastern Africa, except that in Egypt she

exercises control by virtue of a status which has not yet been definitely determined. It is in the country to the north of British East Africa on the upper courses of the Nile that the famous campaign of Sir Herbert Kitchener has been going on in the year 1898 for the purpose of regaining for Egypt the lost provinces of the Soudan. To pass now to the western coast of Africa, another great tract of British territory lies around the lower courses of the Niger. The area of the Niger territories, as determined by agreements with France and Germany and with the native princes, included in 1898 about 500,000 square miles. Along the coast at the mouth of the river this territory is known as the Niger Coast Protectorate and is administered by the Royal Niger Company. The eastern boundary separating the Niger territories from the German colony of Cameroon has been fixed beyond dispute and on the north the boundary separating the British possessions from the French has also been determined, but the western boundary became a subject of dispute between France and England in 1898, the French having occupied Bussa and other places claimed by the British. This dispute was settled by an agreement announced in August 1898, the French having abandoned their claim to Bussa in return for some territorial concessions (see NIGER TERRITORIES). The district of Lagos (q. v.) to the west of the Niger river belongs naturally to the Niger region. The other British lands on the western coast are the Gold Coast, Sierra Leone, and Gambia, all of which are surrounded on three sides by foreign territory and blocked against expansion toward the interior.

The French Possessions.—The enormous possessions of France in Africa include the greater part of the Sahara region which was guaranteed to her by an agreement with England in 1890. Since this barren district makes up such a large part of her territory, the worth of her African possessions does not correspond to their area in square miles. Her foothold in Africa dates from the time when she established factories along the western coast of Africa. Traders from Normandy visited the Senegal as early as 1626, and under Louis XIV, the Royal Company occupied a long strip of territory which was afterward by the Treaty of Nimeguen guaranteed to France. She acquired Algeria after her war for the suppression of the Algerian pirates in 1830. The French claims in Africa cover a territory comprising about 3,300,000 square miles, including Madagascar. In Algeria and Tunis her claims established by right of conquest seem not to be disputed. The broad tract of the Sahara desert, lying to the south of Algeria and extending to the Ivory Coast and comprising the whole distance from the shores of the Mediterranean to the Gulf of Guinea, is all hers. Morocco lying west of Algeria cuts off the northwest portion of this tract and adjoining it to the southwest is the Spanish tract known as Rio d'Oro. At Cape Blanco the French tract emerges on the coast along which it extends, including Senegal, to the northern limit of British Gambia. Portuguese Guinea to the south of Gambia also indents the French territory which, however, reaches the coast again in French Guinea. Then the English dependency of Sierra Leone and the free state of Liberia interrupt the French coast line which is once more resumed on the Ivory Coast on the Gulf of Guinea. To the east of the Ivory Coast lies the Gold Coast belonging to Great Britain and to the east of this the German possession called Togoland. Then comes a block of French territory, Dahomey, bounded on the west by Togoland and on the east by the Niger Territories. The French claims embrace the greater part of the Upper Niger, including the bend as far as Say. There have been disputes recently over a small area lying behind the British Gold Coast and German Togoland. In 1898 an agreement was reached with Germany in respect to the latter. For an account of the dispute with Great Britain see the article NIGER TERRITORIES. The southwestern part of this extended and continuous French tract is known as the French Soudan, but Senegambia is the name given to the most westerly portions. The French Soudan and Senegambia together cover about half a million square miles, and the French Sahara has an estimated area of 1,500,000 square miles. Another important French possession in Africa is the French Congo extending along the western coast from the German possession of the Cameroon on the Bight of Biafra to the point at which the Congo Free State and Portuguese Angola meet on the coast and along the northern side of the Congo and into the interior as far as Lake Tchad on the northwest and British East Africa on the east. The boundaries between French Congo and German East Africa and the Congo Free State have been determined, but on the east the line is still unsettled and here is the seat of the conflict of claims with Great Britain, especially in respect to the Bahr-el-Ghazal district, which was one of the abandoned districts of the Egyptian Soudan. This district was included in British East Africa by an agreement between Great Britain, Germany and Italy, but France did not consider this agreement binding upon her and a serious international complication arose out of the expedition of Major Marchand to Fashoda (see EGYPT). France is ambitious to carry her territory in an unbroken line between the eastern and western coasts, but Great Britain has barred the way, having declared a few years ago that any

attempt of France to establish herself on the Nile would be regarded as "an unfriendly act."

On the eastern coast France has a little wedge of territory called Obok, or Obock, extending inland from the mouth of the Red Sea, opposite the British possession of Aden; also the important island of Madagascar with an area of some 280,000 square miles.

German Possessions.—Germany began her career as a sharer in the African spoils by the acquisition of Damaraland and Namaqualand on the southwestern coast with an area, according to an arrangement with England, of 322,450 square miles. On the East African coast her territory is of more value. It is known as German East Africa and is bounded on the north by British East Africa, on the west by the Congo Free State and British Central Africa, and on the south by Portuguese East Africa. There is access to the water in any direction; on the northern boundary lies the lower half of Lake Victoria, on the western Lake Tanganyika throughout its entire length forms a part of its boundary, and on the southwest Lake Nyassa divides it from British Central Africa. Its limits have been determined by agreements with England, Portugal, and native princes. Its area is placed at 385,000 square miles. Germany also has in the Cameroon on the western coast some 190,000 square miles of property, extending northeastward to the southern shore of Lake Tchad. This is a thickly populated country and shows signs of advancement. Togoland, also German, is a wedge of territory extending inland from the Gulf of Guinea and expanding into a broad hinterland whose limits have been roughly defined by an agreement with France. In this neighborhood, however, there is still a region, the claims to which await adjustment between Germany and England.

Portuguese Possessions.—Portugal, the oldest sharer in African lands and formerly the claimant to an enormous empire, is now restricted to the large block of territory called Angola on the western coast and a strip extending north and south of the Zambesi on the eastern coast. There is also a small wedge of territory belonging to Portugal on the western coast between British Gambia and French Guinea, and she still holds the Cape Verde Islands and St. Thomas, making a total area of about 750,000 square miles. She has shown little enterprise in the management of her colonies and in a large part of the region which ostensibly belongs to her she has effectually occupied hardly more than the coast.

The Congo Free State.—The Congo Free State, lying in the basin of the great Congo river, was established on its present basis by the Berlin Congress of 1884-85, its boundaries being defined by agreements with the various powers. Under the management of Leopold II, King of the Belgians, it has flourished and at present covers over 900,000 square miles, with a population of about 30,000,000. See the article CONGO FREE STATE.

Italian Possessions.—Next to Portugal the country that has shown the feeblest grasp on African territories is Italy. In 1870 an Italian trading company gained possession of a small district near the mouth of the Red Sea for the establishment of a coaling station. Twelve years later the Italian government joined actively in the race for African lands and pushed the boundaries of its possessions northward till they reached a point on the Red Sea about 650 miles to the north of the limits acquired in 1870. This point was reached in 1888. After that Italy began a course of aggression toward Abyssinia which resulted in the ultimate failure of her plans. After the defeat of Adowa in 1896, she gave up her projected conquest of Abyssinia, recognized the independence of that country, and submitted to terms which confined her to a strip of territory along the Red Sea containing about 88,500 square miles. This is the Italian colony of Eritrea. Her claims, however, embrace some 335,000 square miles in addition, namely the tract which runs southwest along the coast from the gulf of Aden and includes a large portion of Somaliland. She has shown herself unable or unwilling to make the necessary sacrifices for the retention of her colonies and has followed the policy of military occupation rather than permanent settlement. This fact, combined with the vigorous policy of the Abyssinian monarch led in 1898 to the prediction that Italian enterprise in East Africa was doomed to an early failure.

Spanish Possessions.—Spain, whose importance as an African power, is hardly worth reckoning, has, in addition to the Rio d'Oro on the northwest coast, the Canary Islands, Tetuan in Morocco, and a few other small tracts, amounting to about 3,800 square miles.

Other States.—As to Egypt a description of her territories and claims more properly belongs to the article on Egypt. The Soudan provinces of Egypt have an estimated area of 800,000 square miles, while Egypt itself covers about 400,000. To the west of Egypt lie the Turkish possessions of Tripoli and Fezzan, to the south of which is the wide unannexed territory of the Sahara, covering about 800,000 square miles. The southern portion of this unannexed territory, Wadai, abuts on French territory, and, it is thought, will eventually be annexed by France.

Morocco is still unannexed and governed by a native sultan. Other free states

are Liberia, whose territory, however, has been considerably cut down by French encroachments and in 1898 amounted to only about 14,600 square miles; and the two Boer republics, namely, the Orange Free State and the Transvaal (qq. v.).

Such was the general condition of Africa in the year 1898. The above account is based on the authority of J. Scott Keltie, Secretary of the Royal Geographical Society of England. Further details in regard to the separate divisions will be found under their respective heads.

The African Situation in 1898.—During the year 1898 the rivalry between the sharers in African territories was sharpest in the case of England and France, whose contest was carried on in two widely separated parts of the continent—first in West Africa in the region of the Upper Niger, and second in East Africa in the region of the Upper Nile. Of these two disputes the second was by far the more important, for in the region of the Upper Nile the trans-continental schemes of the two great powers came into direct conflict. France was naturally eager to open her line of communication directly across the continent from east to west, bringing her sphere of influence in the Sahara and her Congo colony into connection with her little strip of territory on the gulf of Aden. England on the other hand had even more at stake. For many years she had dreamed of a great African Empire which should extend from the Cape to Cairo. The work of the ablest Englishmen in Africa has tended steadily in that direction. What seemed ten years ago to be merely a vague hope appeared in 1898 to have a fair prospect of realization. The work of Cecil Rhodes, Sir Henry Johnston, Captain Lugard, Sir Henry Colville, Lord Cromer, Lord Kitchener and many others has carried the British influence in Africa to the point at which it may be said that the Cape to Cairo policy is almost an accomplished fact. In 1898 the distance from the Cape to Cairo, 6,300 miles, could be covered in 81 days, and it was expected that by 1905 the time would be reduced to 43 days. A trans-African telegraph line is being pushed forward with rapidity; there are British steamers on Lake Tanganyika, and the railway on the Upper Nile is in steady progress. The only interruption to the English line of connection between Egypt and Central Africa in 1898 was the strip which had been ceded to Germany between Lake Tanganyika and Uganda.

English and French Colonial Systems.—England's work in Africa has been greatly praised. Many critics hold that she has done more for the civilization of the continent than any other power. Even among the French there are some who take this view. For instance a French writer in 1898 contrasts the success of the British with what he calls the failure of the French in Algeria and Tunis, and goes so far as to say that under British rule Algeria would become in less than five years time a most prosperous colony, a result which France has not brought about during the whole sixty years of her rule. Madagascar is also taken by this writer as an instance of French inefficiency. He estimates the cost of its conquest by France at 4,000,000 pounds and the lives of 6,000 Frenchmen. And when the island was once in the hands of the French they immediately imposed prohibitive duties on foreign goods with the idea of keeping it for French trade, but with the result of checking trade altogether. On the other hand England's policy of the open door in her colonies has led to a great development of trade in which all countries have shared. How effectively this policy is carried out appears from the fact that in many of the British colonies and in Egypt a large part of the increase of the trade consists of the commerce with other countries than Great Britain.

Yet this unfavorable comparison between the British and French colonies in Africa does not seem sufficiently to take into account the restricted resources of France or the fact that the French in Africa have hitherto been actuated by military rather than commercial motives. France has not yet begun to develop her newly acquired lands because she has applied herself too eagerly to the extension of her borders. But in the spread of her military occupation she has done much for the cause of humanity by policing savage districts and suppressing the slave trade and other barbarous practices. And the establishment of an efficient police is, after all, the first duty of a power that would attempt to civilize Africa. For some account of the two great territorial disputes between France and England in 1898 see the articles NIGER TERRITORIES, EGYPT.

AFRICA. BOTANY OF. See BOTANY (paragraph Systematic Botany—Africa).

AFRICAN METHODIST EPISCOPAL CHURCH. See COLORED METHODISTS.

AFRICAN METHODIST EPISCOPAL ZION CHURCH. See COLORED METHODISTS.

AFRICANDER BOND. See CAPE COLONY.

AGASSIZ ASSOCIATION, founded in 1875 to encourage personal work in natural science among young people, was incorporated in 1892 in Massachusetts. Its organ is the *Popular Science News*. The society had (1898) more than 100

chapters in various parts of the world which make zoölogical, botanical, entomological, etc., collections.

● **AGRARIAN MOVEMENT** is of long standing in the Austro-Hungarian Monarchy.

Galicia.—During 1896 and 1897 it was especially pronounced in Galicia, where it dates from the time when Galicia was annexed to Austria. The old village community known as the *Mir*, a Slavonic inheritance, had formerly been in existence there and when it was abolished for the system of private property the peasants complained that their rights had been disregarded in the apportionment, although a part of the forest and pasture land continued to be held in common. From this arose a sharp antagonism between the peasants and their landlords, and at the time of the revolutionary movement of 1848 the families of the latter suffered from a violent outbreak of the peasantry. It was not put down until many outrages had been committed on the families of the landlords and it required the interference of the imperial troops to restore order. This grievance still continues among the Galician peasantry, but is felt more strongly at the present time in the western part of the province than in the eastern which had been the scene of disturbance in the past. A very active spirit in stirring up and leading the malcontents was Father Stojaloffski, a priest whose social philosophy is based on the teachings of Karl Marx and whose political creed rests on a rooted belief that landlords are tyrannical and government officials unjust. After repeated ecclesiastical punishments he gave up his living in Galicia and placed himself under the jurisdiction of the church in Albania, but he remained in Galicia where he edited two magazines of a somewhat social-democratic character. He continued to appeal to the passions of the people in spite of frequent government prosecutions and an excommunication by the Pope. This excommunication against which he protested on the ground that it was contrary to church law, did not seem to impair his influence even in that strongly Catholic community in which he resided. His preachings revealed a hatred of the Jews and a tendency to draw toward his Slavonic kinsmen in Russia, but his main idea was the rendering of justice to the peasantry which he asserted had been robbed of its rights by the nobles. At last the hostility of the government drove him to Hungary, where the authorities refused an application for his extradition. His influence was very powerful in the electoral campaign of 1897, when he appealed to the peasantry to send honest representatives to the *Reichstag* and to vindicate their rights which had been betrayed by the landlords. Agrarianism was active also among the Ruthenians and there took the definite form of a demand that the large estates should be purchased and divided into peasant holdings. The Ruthenians also had national aims, but on this Agrarian policy they were in accord with their Polish neighbors.

Hungary.—In Hungary the Agrarian movement has not been prominent until recent years. It differs in its spirit from the movement in Galicia for it seems to have arisen from the spontaneous action of the Hungarian peasants without the stimulation of enlightened leadership and exhortation. The movement came to light at the time of the meeting of the Agricultural Labor Congress at Budapest early in February 1897, when steps were taken to establish on a firm footing an organized party for Agrarian and socialistic ends. Among the points in the platform of this party were an insistence upon the reduction of hours, the increase of wages and the abolition of the corvée system. The movement seemed to be strongest in the most fertile parts of Hungary where the bulk of the population were landless and derived their subsistence mainly from working as agricultural laborers on the farms of the large proprietors, for in this region the land is divided for the most part into quite large holdings. The weapon which the Agrarians threatened to use to enforce their demands was the organization of strikes. The government showed a willingness to listen to the grievances of the landless people in this section but it was hard to find a suitable remedy. The reduction of the hours of labor seemed likely to injure rather than benefit the working classes, since their work being mainly agricultural, depended upon the seasons and cutting down their hours during the season of their employment might cause actual hardship. On the other hand, the price of agricultural produce was so low that a general increase of wages was impossible. The discontent was not confined to the agricultural classes, however, but showed itself among the industrial workers. In January, 1897, a serious strike occurred among the coal miners at Temesvar in Hungary, and resulted in a conflict between the strikers and the gendarmes in which nine persons were killed and eleven wounded. There was also a threatened strike of the harvesters, and violence was averted only by a show of force on the part of the government. There were socialistic riots in June, 1897, in some of the peasant communes and many persons were arrested as rioters. In the Alföld district there was a strike of the harvesters and in spite of the importation of labor and the threats of the government, it was almost impossible for the land owners in that district to get in their crops. In Croatia-Slavonia a large body of peasants armed themselves and attacked the Hungarian officials, two of whom they killed.

The government was obliged to declare martial law in this region. Many arrests were made and the government made a show of military force to overawe the malcontents. Affairs were especially threatening in Slavonia where the land was held largely by great proprietors who were often absentees. Of course the racial question enters into this Agrarian movement and adds to the hard feeling, for there is a strong party which favors the separation of Croatia from Hungary and the formation of an independent Slavonic kingdom comprising several of the provinces of the Empire.

On Christmas Day, 1897, a meeting of agricultural laborers was held at Budapest and formulated various demands in respect to industrial and political matters, including the eight hour day, universal suffrage, secret ballot, free education, and the abolition of the army. There was an open revolt of the peasantry in the neighborhood of Hatzfeld in March, 1898, and the gendarmes who were sent against them were put to flight. But the government at Budapest had already promulgated a law (March 1) to promote the interests of ordinary day laborers and agricultural laborers. This law required that every agricultural laborer should have a certificate of registration before applying for employment on a farm. He must also sign a formal contract before an official who retains this registration certificate till the contract is fulfilled or legally dissolved. If the workingman breaks his contract his certificate is forfeited for a year, and the wages due him are paid over to an official who deducts what may be due to the employer for damages and applies the rest to public poor relief. But to protect the workingman in his rights, it is required of the employer that he shall supply good food when food is stipulated in the contract, and furnish his employee with medicines and medical attendance for a period of days during sickness. The employer is also required to find other employment for the laborer in case the weather prevents the latter from working in the fields or shall pay him his wages during this period of enforced idleness provided that it lasts no more than a week. On the expiration of a full week the contract may be cancelled. The provisions of the law are enforced by severe penalties. Besides improving the condition of the agricultural laborer the law aims to put an end to political or socialistic agitation and imposes heavy penalties on men convicted of inducing others to violate their contracts or of attempting to stir up discontent among the workingmen.

Germany.—In Germany the Agrarian movement is wholly different from that in the provinces of the Austro-Hungarian monarchy. German Agrarianism has not its root in socialism. Its origin and progress in Germany are due to an organization known as the League of Husbandmen (*Bund der Landwirte*) which was founded in 1893. This association arose from the discontent of the agricultural element in the population in regard to the policy of the government in dealing with the agricultural interests but especially its regulations affecting foreign trade. The agriculturists considered themselves injured by the commercial treaty with Austria formed under Chancellor von Caprivi's administration and the commercial treaty with Russia which had previously been established. A meeting was held in Berlin and the representatives of the agricultural interests there determined to form an organization which should have as its exclusive aim the promotion of the welfare of the agricultural classes in Germany, without regard to political parties or wealth or influence. It was declared that the attitude of the government toward the foreign trade in grain was injurious to the farmers' interests. Its proper policy was to protect the domestic producer and try to bring about the independence of the home market. The system of universal free trade and *laissez faire* was condemned, and on the other hand so were the principles of socialism. The chief ends for which the organization was striving were outlined in its published platform. Among them were the following: Native products must be protected against foreign competition. The rules governing the stock exchange must be reformed, especially in regard to the speculation in the necessities of life. Improved regulations should be introduced in regard to the warehousing of goods in transit. A better system of valuation should be introduced into the customs administration. Taxation should be reformed with a view to the more equal distribution of taxes and special regard should be shown to the agricultural interests until they attained their normal strength. There should be a reform of labor legislation, an encouragement of neighborhood trade in agricultural products, the protection of native products against cheap foreign substitutes and against adulteration of fodder and fertilizers, the appropriation of a large sum for improvements, the building of railroads in the interest of the agricultural classes, and a reform of the tariff system. These are the principal demands of the League. It carries on its work by means of assemblies and by the influence which it brings to bear on candidates for the legislative bodies. It requires a definite answer from these candidates without regard to their political party as to their sympathy with the aims of the organization and unless these answers are satisfactory the League withholds its support.

AGRICULTURE. See the articles on Countries and on the States of the United States; also special articles on BARLEY, CORN, OATS, WHEAT, and other farm products.

AGRICULTURE, U. S. DEPARTMENT OF. See IRRIGATION, PAVEMENTS and ROADS.

AGUINALDO, EMILIO, the leader of the Filipino insurrection against Spain, and of the opposition to the acquisition of the islands by the United States, was born about thirty years ago. The facts of his life are obscured by the conflicting statements made in regard to them. There is uncertainty even as to his parentage, some accounts stating that he was a son of a Spanish general, and others that his father was a dissolute, but learned Jesuit priest. As a child he was a domestic servant in the home of a Jesuit priest in the province of Cavité, where he was well treated, and received advantages in education far beyond those usually accorded to native children. He showed himself an apt scholar and at the age of fourteen or fifteen was enrolled in the medical department of the Pontifical University at Manila. About 1888, having had some trouble with the authorities, he went to Hong Kong where he observed closely all matters pertaining to military and naval warfare and added to his linguistic knowledge, which is said to be considerable. Upon the outbreak of the insurrection in the Philippines in 1896 he became prominent and when the Spanish authorities finding the insurrection unexpectedly formidable proposed certain concessions to the demands of the insurgents, Aguinaldo was one of the peace party. This party finally prevailed, but the compromise agreed upon required that the leaders should leave the country. Aguinaldo then withdrew to Hong-kong where he remained until after the battle of Manila, and where he is said to have had many conferences with the United States Consul, Mr. Wildman. Aguinaldo, Agoncillo and the other Philippine leaders stated that Consul Wildman had promised on the authority of the United States government that the Philippines should be independent. This was denied by the Consul who said that he had merely tried to obtain the aid of the revolutionists in the campaign against Spain. After the battle of Manila, Aguinaldo landed in the Philippines and aided the United States force against the Spaniards, doing, it is said, very efficient work. In June he organized a provisional government for the islands and on the 23d of that month became its president and generalissimo of the Philippines. For an account of his attitude toward the United States when he became convinced that the latter power intended to annex the Philippines, see the article UNITED STATES (paragraphs on History).

AINOS, a people of primitive customs, inhabiting principally the island of Yezo, Northern Japan, of whom until recently but little has been definitely known. They seem to be an older race than the Japanese, are short, stout, dark, and have a European rather than an Asiatic cast of countenance. The men have noble faces; the older ones wearing long beards and masses of thick hair parted in the middle. Almost all of them are habitual drinkers of *sake*, a native intoxicant, and their chief amusement is the bear hunt with its subsequent festival. The women, except when very young, are ugly in appearance, extensive tattoo marks aggravating the disagreeable effect; a heavy, blue-black tattoo band about the lips is a distinctive female fashion. They have a stolid, hopeless expression, which is caused by their constant repression, for they are considered so much inferior to men that they are not supposed to have souls and are therefore allowed no part in religious exercises. The Ainos have little energy and no ambition; they are exceedingly ignorant and superstitious, having no written language and being fetich-worshippers, but they are amiable and full of kindly hospitality, which they show with a shy, child-like simplicity. They wear robes of elm-fiber or cotton, and their huts, utensils, and persons are always very dirty. Medicines and care of the sick are almost entirely recent innovations. Being horrified by the presence and even the thought of death, they have no cemeteries, but bury their dead in some lonely place in the forest the location of which is soon forgotten.

Although the Japanese government makes laws for the protection of the Ainos, and a society exists in Sapporo for their assistance, it is evident that they are steadily disappearing before the aggressive, western-spirited Japanese. According to an account published in 1898, they number about 17,000. Aino curios are rare; a small collection has been made by the Peabody Museum in Salem, Massachusetts.

AIR. See PHYSICS (paragraph Liquid Air); also the article LIQUID AIR.

AIR LIFT PUMPS. See WATER-WORKS.

ALABAMA, one of the Gulf States of the United States, with an area of 52,250 sq. m. Capital, Montgomery.

Agriculture. The following shows the production and value of the principal crops in the calendar year 1898: corn, 39,681,630 bushels, \$16,269,468; wheat, 519,708, \$467,757; oats, 5,383,274, \$2,207,142; rye, 21,745, \$22,832; potatoes, 482,406, \$400,397; hay, 100,755 tons, \$931,984; cotton (season of 1897-8), 1,112,681 bales, \$31,999,174—total value, \$52,298,754. Live stock, January 1, 1899, comprised, horses, 132,224; mules, 129,726; milch cows, 254,727; other cattle, 336,479; sheep, 193,033; and swine, 1,866,640—total head, 2,912,829.

Industries.—In 1897 Alabama ranked fifth in production of coal, with an output of 5,893,770 short tons, value \$5,192,085; third in iron ore, with a product of 2,098,621 long tons, mostly red hematite, value \$1,546,543; and third in coke, using 2,451,475 short tons of coal and producing 1,443,017 short tons of coke, value \$3,094,461. During the year the State found a new and highly profitable market for its iron in Europe and one for its coal in Mexico. Two more large cotton mills were contracted for, to cost \$600,000 and \$500,000 respectively. Thirty-seven cotton and woolen mills were in operation, which had an aggregate of 380,866 spindles, more than four times the number in use in 1890.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise at the port of Mobile were valued at \$1,124,401, an increase in a year, and the exports were valued at \$9,584,248, a decrease. The imports of gold and silver amounted to \$50,852, and the exports of gold alone to \$5,000. The total trade of the port was \$10,764,501, a decrease of \$262,424 from that of the previous year.

Railways.—In both 1897 and 1898 Alabama led all the Southern States in the amount of railroad mileage actually under construction. The State Railroad Commissioners reported at the end of 1897 a total of 3,524 miles of main track, and there were then fully 300 miles of additional track under construction. Combining the main and double tracks with the large number of feeders and sidings the mileage in operation at the end of 1898 exceeded 4,300.

Banking.—On October 31, 1898, there were 26 national banks in operation and 13 in liquidation. The active capital aggregated \$3,205,000; outstanding circulation, \$1,280,553; deposits \$6,765,332; and reserve, \$1,835,625. The State banks on June 30, 1898, numbered 15, and had capital, \$686,000; deposits, \$1,280,819; and resources, \$2,243,563.

Education.—At the close of the school year 1896-7 there were 621,600 children of school age in the State, of whom 319,526 were enrolled in the public schools and 213,000 were in daily attendance. The percentage of enrollment by races was, white, 65.57; colored, 68.45. There were 4,725 white teachers and 2,398 colored. Public school property exceeded \$1,500,000 in value, and the total expenditures, excluding payments of bonds, was \$663,359, of which \$618,668 was for teachers' salaries. The public high schools numbered 52, and had 126 teachers and 2,547 pupils, and the private secondary schools, 76, with 185 teachers and 3,165 pupils. There were 6 public and 5 private normal schools, with a total of 2,423 students. For higher education there were 9 colleges and universities, co-educational and for men only, with 92 professors and instructors and 1,650 students; 10 colleges and seminaries for women, with 102 instructors and 918 students; an institute of technology; a law, 3 theological, and 2 medical schools; and 13 institutions for the higher education of the colored race. The Alabama Polytechnic Institute at Auburn, endowed by Congress, received from the Federal treasury \$22,000 in 1897 and \$23,000 in 1898. In 1898 there were 219 periodicals in the State, of which 17 were dailies, 181 weeklies, and 12 monthlies.

Finances.—The total bonded debt of the State in March 1898, was \$9,357,600, of which the greater part is due in 1906. The property valuation in 1897 was \$251,390,134; tax rate, 5½ mills; and amount of taxes \$1,384,171.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 1,690,000.

History.—The history of the State during 1898 is a very quiet one. On June 16 the negro Republican leaders held a State Convention and nominated a full black ticket, which had never been done before. The Democratic State Convention reaffirmed the Chicago platform of 1896. At the election the Populists were beaten and the Democrats carried everything. Joseph F. Johnston was elected Governor by a plurality of 59,772. A new code went into effect in February, embodying some changes in criminal cases of appeal to the Supreme Court. When the court is satisfied that a defendant got substantial justice in a criminal case it shall not reverse the judgment because of error in the record. The married woman's law is also changed, so that she is treated as a *femme sole*, except as to her real property. Women are also made eligible to fill the office of Register of Chancery; several already hold that position. The new code abolishes the rule requiring two witnesses to overcome the sworn answer of the defendant. In December the Governor signed a bill passed by the legislature for the election of a convention to make a new constitution for the State. The convention is expected to devise some scheme for eliminating the colored vote under the forms of law. It would appear, therefore, that Alabama is likely to follow the example set by Mississippi, South Carolina, and Louisiana in regard to establishing white supremacy.

National Representatives and State Officers.—The Representatives from Alabama are all Democrats: George W. Taylor, Jesse F. Stallings, Henry D. Clayton, Gaston A. Robbins, Willis Brewer, John H. Bankhead, John L. Burnett, Joseph Wheeler, and Oscar W. Underwood. The Senators are: John T. Morgan, from Selma,

and Edmund W. Pettus, from Selma, both Democrats. Joseph F. Johnston, Governor; R. P. McDavid, Secretary; George W. Ellis, Treasurer; Walter S. White, Auditor and Comptroller; Robert F. Ligon, Adjutant-General; C. G. Brown, Attorney-General; J. W. Abercrombie, Superintendent of Education; Isaac F. Culver, Commissioner of Agriculture. All of these are Democrats. Justice of the Supreme Court, Thomas N. McClellan; Associates, Jonathan Harolson, John K. Tyson, Henry A. Sharpe, and James K. Dowdell; Clerk, R. F. Ligon, Jr. All are Democrats. The State legislature is Democratic by an enormous majority.

ALASKA, a territory of the United States comprising the northwestern part of North America, purchased from Russia in 1868, has an area of over 500,000 square miles and a population, estimated by Federal officials on June 30, 1898, of about 50,000.

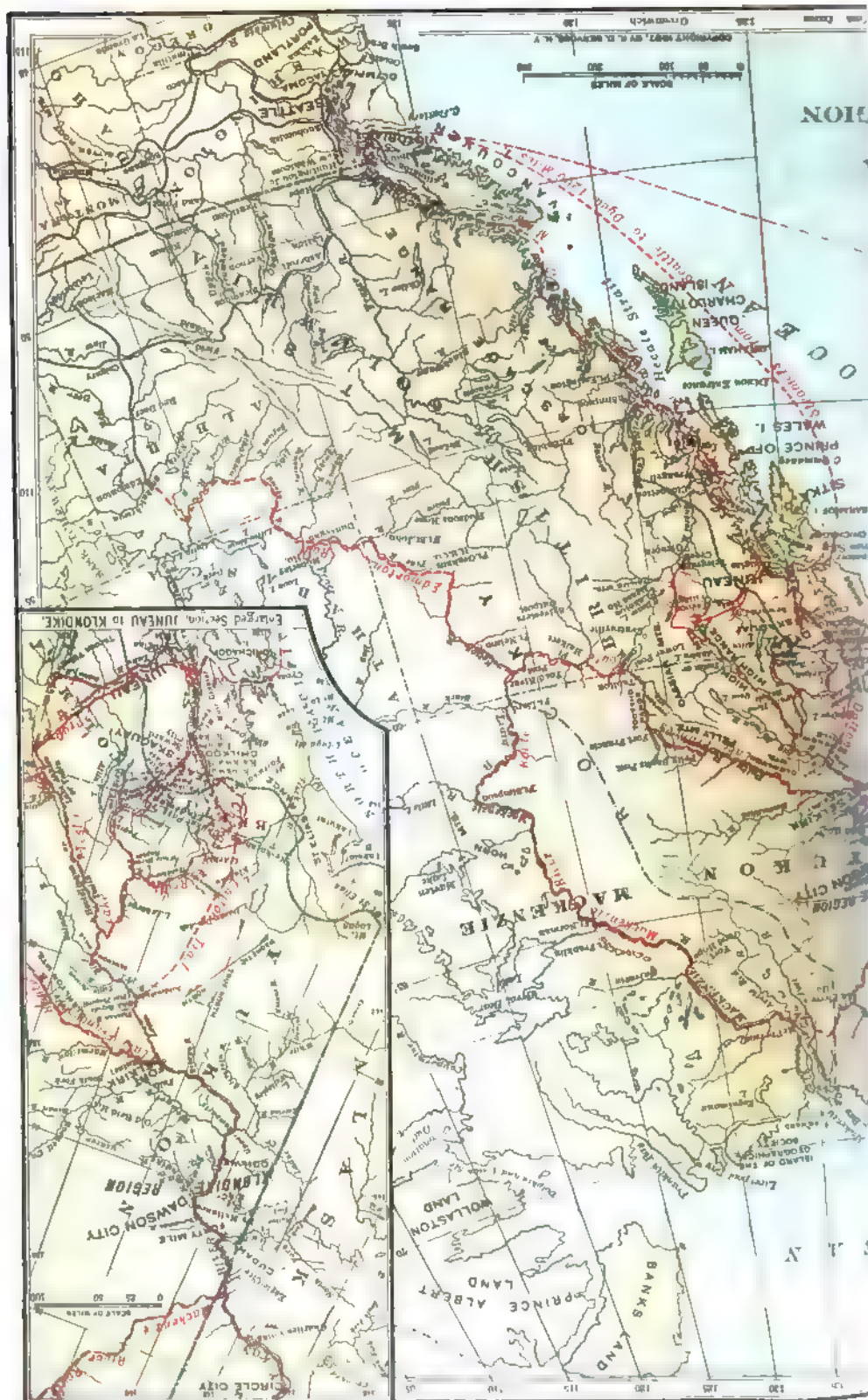
Topography.—Officials of the United States Coast and Geodetic Survey continued their work during 1898, with many valuable results. Prof. George Davidson completed the first authentic map of the Copper river region, showing also Cook's Inlet, the Tanana river and the Yukon. All the tributaries of these rivers are traced and named, the measurements of the numerous capes are given, and the topography of the region, in several instances of a character not previously suspected, is quite fully described. During the summer a surveying party under G. H. Pratt discovered that owing to the incorrect charting of the coast line in the vicinity of the Kusilvak channel the area of the territory is 2,500 square miles larger than has ever been reported.

Industries.—The season of 1897-8 did not yield as large mining results as were expected. The rush to the gold fields continued as great as ever for a while but afterward fell off considerably on both the American and Canadian sides of the boundary. This applies chiefly to the Klondike region. It was expected that American operators there would take out about \$20,000,000, but reports at the close of the year indicated that shipments would scarcely aggregate half of that sum. In some parts prospectors had become so discouraged that they abandoned their search for gold and had located rich coal claims. The region between Cook's Inlet and Copper River is believed to be full of coal veins of excellent quality. Large ledges of copper and gold ore were reported as having been discovered on Gravina, Annette, and Revillagigedo islands in the southeast coast, and promising hundreds of thousands of tons without the necessity for sinking shafts. Prince of Wales Island is now known to contain a great mass of rich ore. E. Hazard Wells, of the War Department, who has traversed interior Alaska in many directions and has a large practical knowledge of the country, declares that there are great deposits of gold in the Territory that rival those of the British Northwest Territory. He is particularly enthusiastic concerning the region through which the Tanana and its tributaries flow.

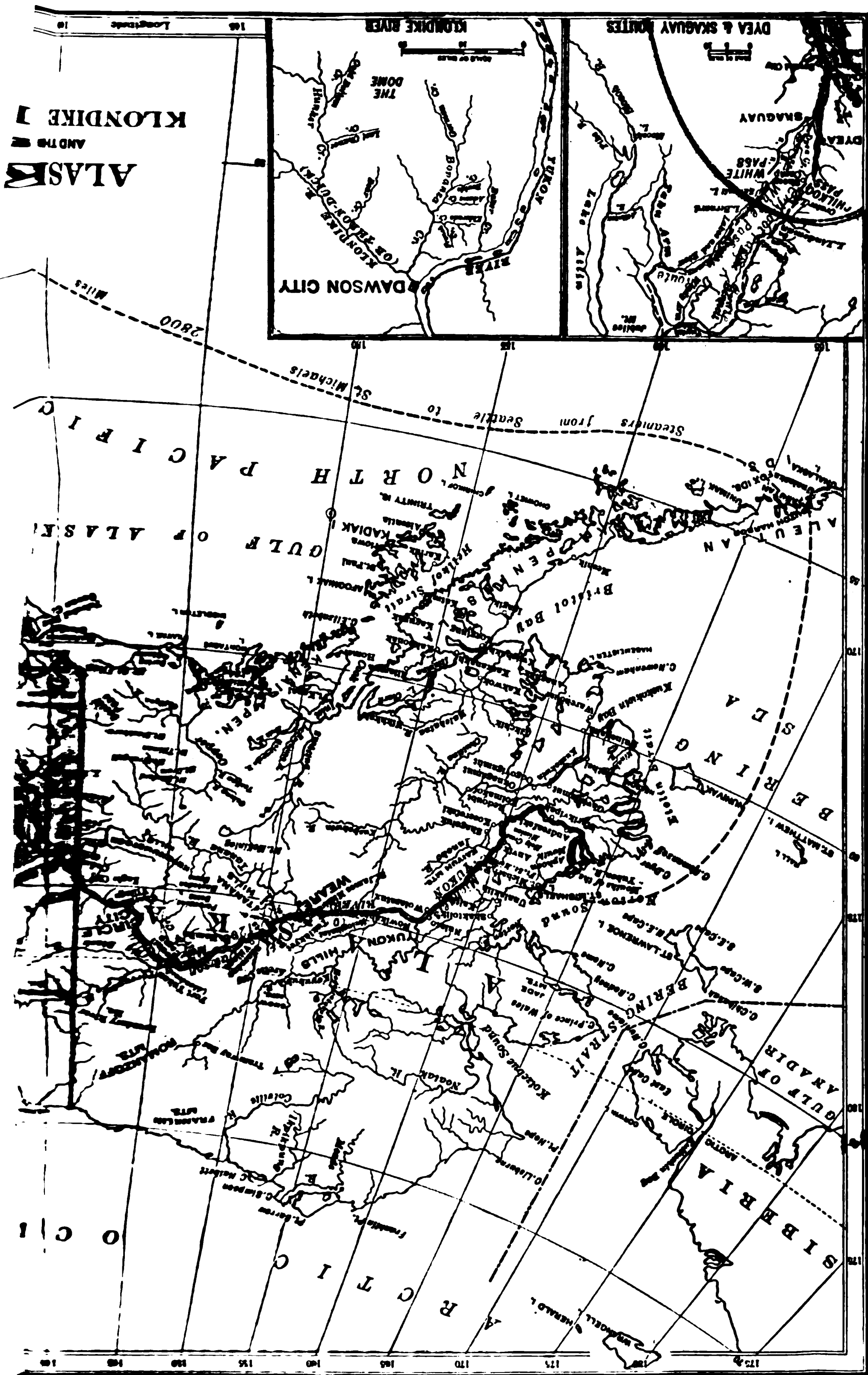
During the year new gold fields were discovered in American territory between Big and Little Skookum, Fresno Creek, and on Monte Cristo Island. Farming has been found to be impracticable throughout most of the territory, but Catholic missionaries have established an agricultural station.

Along the coast at Juneau, Sumdum, Seward, Douglass and Admiralty Islands, and other points, "deep," or "quartz," mining is well established. The rock is of the post-Jurassic and Tertiary ages while that of the Yukon Valley is much older, being probably pre-Paleozoic and in part perhaps Archæan. Geologists assume the presence of gold in all that part of the Dominion north of British Columbia and west of the Yukon-Mackenzie watershed, except the part north of the intersection of the Yukon and the 141st meridian. It can safely be said that there are at least 3,000 miles of stream and gulch in the upper Yukon district that can give good returns for placer mining. The richest part hitherto known is near the Klondike, sixty miles east of the American boundary. It has been estimated that the immediate region of Bonanza and Eldorado Creeks (both of which are in the little Klondike basin) will yield \$75,000,000. It should be said, however, that there are many claims in this very region that scarcely pay for the working. Quartz mining in the Yukon district, owing to the great difficulty attending it, has hardly yet been begun; but Mr. William Ogilvie, the Dominion Surveyor in the Yukon district, reports that the gold-yielding quartz is inexhaustible.

The method of placer mining is to sink a shaft to bed rock, the depth varying from 4 to 30 feet. Usually a miner strikes first a thick stratum of frozen muck. This he thaws with wood-fires, the soil being alternately thawed and removed until the frost limit is passed. Beneath the muck is a layer of rubble usually of 3 or 4 feet, then a thin layer of dirt or clay, and beneath this, lying on the bed rock, is the streak of nuggets and gold flakes. From the bottom of the shaft tunnels are driven in various directions to the limits of the claim. The labor of burrowing the "levels" by the light of a lantern is great though for the time the miner is sheltered from the icy winds. The "pay dirt" is heaped until summer and is then washed until only the heavy dust and nuggets remain.



ALASKA
AND THE
KLONDIKE



Dr. George M. Dawson, Director of the Canadian Geological Survey, says that placer mining on the Klondike is likely to continue for a number of years, the greatest output probably being in 1899, and that meanwhile the country will be filled with prospectors, and other mining districts, though perhaps not as rich as the Klondike, will be worked. Quartz mining will probably be developed and conditions will become more favorable for continued and comfortable residence.

On October 31, 1898, Alaska had one national bank, with a capital \$50,000, circulation \$2,350, and deposits \$49,368.

Communications.—The all-water route to the Klondike is 2,705 miles from Seattle to St. Michael and 1,313 miles up the Yukon to Dawson, the voyage taking about seven weeks. The most feasible land routes start from the head of the Lynn Canal. Dyea is 1,115 miles from Seattle and the Dyea, or Chilkoot Pass, route leads 527 miles northwest to Dawson. The Skaguay, or White Pass, route is somewhat longer and more difficult than the Chilkoot. The Dalton route, which crosses the Chilkoot Pass, joins the others at Fort Selkirk. Hitherto the Chilkoot route has been the most popular, but it is probable that in the future the Teslin route will prove the most advantageous. This route, starting from Fort Wrangel, leads up the Stikine and down the Hootalinqua Rivers. The proposed railway connecting the Yukon district with the Canadian system is a present impossibility.

Early in 1898 the aerial railway over Chilkoot Pass to Lakes Linderman was completed. This unique enterprise shortened the time between tidewater and the headwaters of the Yukon river from a month to a day, and removed the perils and hardships of former travel. The Canadian government has selected five routes for railways into the Yukon region, which possess an interest to Americans because their seacoast outlets are in the territory of the United State. Four of these as projected will cost upward of \$15,000,000.

The first railroad built in Alaska is the White Pass and Yukon, which is projected from Skaguay to Fort Selkirk. By November 1, 1898, this was in operation as far as Summit, which is about sixteen miles from Skaguay and at the highest point of the divide. On October 5, work was begun on the Canadian section of the line. It was thought that by the middle of February, 1898, the road would be in operation as far as Log Cabin, thirty miles from Skaguay.

Discoveries on the Coast.—In October 1898, John F. Pratt, in charge of a party of the Coast and Geodetic Survey, consisting of fifty men under six officers, who discovered the above-mentioned error in the chart, reported that a new channel for Yukon-bound vessels had been found. The discovery of the new channel will save from 400 to 500 miles in reaching the Yukon. Hitherto, vessels have had to proceed outside the long bar extending along the coast, at an average distance of twenty-five miles, to St. Michael, transship there to small boats which crawl along the coast a hundred miles below to the Aphoon Channel which is only two feet on the bar at low tide. Referring to the new channel the report says: "The Kusilvak Channel extends very nearly parallel with the shore until about half way to the Krypniak, when it turns seaward, and when beyond the sight of land spreads out into a bar with from six to eight feet on it at low tide. On each side the flats are irregular, with blind pockets, etc. The shores in the vicinity of Kusilvak mouth are about twenty-five miles further out into Behring Sea than indicated on the published charts. In round numbers this difference includes an area of about 2,500 sq. m. . . . It is now a foregone conclusion that the passenger business of the upper Yukon country is and will remain via the passes, while for a long time the great bulk of the freight will go via the river's mouth. There are now between 60 and 70 regular river steamers in the carrying business and still freight was left behind at St. Michael when the season closed in. The ocean traffic has been proportionate, there being as many as 30 deep-water vessels at anchor in St. Michael anchorage at a time, the average during the season being twenty. The greatest stumbling block in the St. Michael freight business is the transfer from ocean to river craft in an unprotected roadstead, the water depth being such that ocean steamers do not anchor within about two miles of the nearest shoal water landings. If next year's examinations should develop the fact that somewhere in Scammon Bay the shores were bold enough to enable sea-going vessels to discharge at docks, then by artificially marking the Kusilvak entrance so that it could be readily found, the cost of freight transportation could be sensibly lessened."

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise into Alaska were valued at \$134,974, and the exports were valued at \$30,705—an increase in both cases. Much of the trade to and from the territory is entered at the customs districts of Puget Sound and San Francisco and is accredited to them.

Education.—At the close of the school year 1896-7, there was an estimated school population of from 8,000 to 10,000, of whom 1,395 were enrolled in the twenty government schools in operation during the year. The total amount available for the support of these schools was \$36,500. For three years prior to 1892-3 the govern-

ment annually appropriated \$50,000 for public education in Alaska; since that year the amount has been \$30,000. In 1898 the Secretary of the Interior Department and the Governor of the Territory earnestly recommended an appropriation of \$60,000 because of the increase in population and towns and villages. There were 17 public school buildings, which had cost \$26,536. About 25 native children were being educated at the Carlisle Indian School, Pa. The Presbyterian, Moravian, Congregational, Baptist, Methodist Episcopal, and Protestant Episcopal Churches and the Swedish Mission Covenant maintained religious and educational missions. The periodicals comprised a monthly and six weekly papers.

The difficulties under which education progresses in Alaska are well illustrated by the experiences of Miss Fulcomer, the teacher of the public school in Circle City. "I arrived here on August 17, 1896, finding no school building ready for me and not a vacant house in town in which I could open the school, consequently I was obliged to wait, impatiently, until October 1, when the building was under roof; then I opened my school in spite of the fact that the windows were not in and the doors were not hung. The men worked, off and on, while I was teaching, but it was not until December 12th, that the work stopped. Since that time the house has been as snug and comfortable as any place in town. During the winter nearly all the men in town left for the new gold diggings at Klondike where they were more successful than they were here. When the ice ran out of the Yukon the third week in May, these men came down the river, packed up their belongings and moved to Klondike with their families. This is one reason for the sudden decrease in the school attendance during May. The other reason is that, at last, spring sunshine had come. For seven months it had been so cold and stormy that the children could have no out-of-doors play life. In May the weather moderated, the sun shone warm and bright, the snow began to melt, ducks, geese and song birds slowly came, and the children were fairly wild to be out of doors. It seemed almost as much of a sin to keep them in the house as it does to keep our faithful farm animals shut in the dim musty barn and feed them on dry hay. Many native children dropped out and I did not blame them. However, I kept on with an attendance of eleven and twelve pupils. But it suddenly grew intensely hot; all kinds of bugs and worms began to wake from their winter's sleep and came crawling out of the moss filling the chinks between the logs—bees, hornets and our terrible pest mosquitoes. With such visitors as these the children could not study; so, before long we had to stop school. Teaching school in this far north land is altogether different from teaching in the States, and the teacher is at times compelled to change the usual order of things and use her own judgment, depending on the Department's having faith enough in her to sanction such changes. For nearly three months during the winter the people want to hibernate. They can not help it, for there seems to be something in the air tending to that result. The days are so short that the people sink into a kind of stupor, not wanting to rouse up when daylight comes, even though that be delayed until eleven in the morning. During these dark months I was always at the school before half-past nine, but was usually alone there until half-past ten, when the children would straggle sleepily in, some without breakfast. By noon all would be there."

History, 1898.—The rush of miners who knew nothing of the severities of the climate entailed considerable suffering; and early in the year the reports were so alarming that the government organized a relief expedition with some six hundred reindeer, but on more re-assuring advices this was abandoned at the beginning of March. The majority of miners seek the gold fields by crossing the mountains, and the dangerous White and Chilkoot Passes have been the scenes of many disasters. On April 3, avalanches in the Chilkoot overwhelmed more than a hundred travellers. Exploring parties under the government have sought other routes wholly within American territory; among others via the Copper River. It is variously estimated that from 50,000 to 100,000 entered the Yukon Valley during the open season of 1898. The greatest difficulty of the journey is occasioned by the 1,500 pounds of luggage which each prospector ought to take with him, for the Indian guides have exorbitant charges and are very unreliable. The luggage consists of wearing apparel, a year's provisions, mining and carpentry tools, and sometimes a boat in sections. The rapid development of Alaska has necessitated many judicial and legislative changes. Governor Brady, in his annual report for 1898, made a strong plea for Congressional action on Alaska's needs and urged a speedy granting of citizenship to Alaskans. Much legislation for the territory was projected during the year. In Congress the House favored the granting of rights of way to railroads, and in May adopted the conference report on the bill extending the homestead laws to Alaska. The bill provided that no homestead exceed 80 acres at \$2.50 an acre; that tracts of land along the water front of any stream, inlet, bay, or sea shore for landing places, for canoes and other craft used by natives, be reserved; that the Annette and Pribilof Islands and the islands leased or occupied for the propagation of foxes also be excepted. The Treasury Department issued regulations governing the transportation of mer-



(By courtesy of *McClure's Magazine*.)

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SCENES IN THE KLONDIKE REGION.—1. Carrying-boats on the Yukon. 2. Lake Line
on the Lewis River



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trans. 3. Prospectors moving boat timbers over Chilkoot Trail. 4. The "Eagle's Nest"
near the Little Salmon.

chandise from American customs ports to the British Northwest Territory. The Senate Committee on Territories reported favorably a bill providing a new form of government, which would enlarge the powers of the governor, create a civil and judicial district with three divisions, covering the territory, extend to it the Federal mining laws, and, as far as applicable, place the territory under the general laws of the State of Oregon. During the year 1898 the chief interest lay in exploration and mining. Early in February the increase of lawlessness in the territory decided the Cabinet to send four companies of the Fourteenth Infantry to Dyea and Skaguay. About the same time the treasury issued regulations governing the entry and transportation of merchandise for the Klondike region by way of Juneau, Dyea, Skaguay, and other ports in Alaska. Goods for the Klondike may be forwarded without payment of duty in charge of a customs' officer at the expense of the importer, or upon the filing of a bond for its exportation equal to the duties and charges. All imported animals or merchandise abandoned or sold *en route* will be seized and forfeited to the government unless the duties are paid thereon. All articles carried by passengers which are in use are exempt from duty. Regulations were also issued concerning the navigation of the Yukon and Porcupine Rivers and their tributaries, providing that the transfer of cargo and passengers from a river or sea-going vessel from a port in the United States except another port in Alaska, or from any foreign port, to a vessel destined by way of the mouth of the Yukon or Porcupine River, shall be permitted only at the port of St. Michael, under the supervision of customs' officers. The long pending disputes between the United States and Great Britain, the latter acting on behalf of the Dominion of Canada, over the boundary between Alaska and the British possessions and the fur seal and other fisheries, were referred to a Joint High Commission, appointed by the United States, Great Britain, and Canada in 1898 to negotiate a settlement of all cause of controversy between the United States and Canada. The Commission held sessions in Quebec and Washington, but had not completed its work at the end of the year. (See CANADA, paragraph Anglo-American Commission.) On October 14 Dawson City was partly destroyed by fire; the loss was estimated, on account of the enhanced value of property, at \$500,000. The following laws, made by the Canadian government, are observed for placer mining in the upper Yukon district: For "bar diggings" the claim is a strip of land 100 feet wide at high-water mark and extending along the river to its lowest water level—"bar diggings" meaning any part of a river over which water extends in flood season, but not as low water. For "dry diggings"—mines over which a river never extends—the claim is limited to 100 feet square. "Creek and river claims" are 500 feet in length, measured along the stream, and extend from base to base of the hills on each side; except that when the bases are more than 600 feet apart the width is limited to that size, and when the bases are less than 100 feet apart the width may be extended to 100 feet. The corners of all claims must be marked by posts on one of which is the name of the owner of the claim. Within sixty days a claim must be recorded at the nearest law office; a fee of \$15 is required for registry and an annual fee of \$100 thereafter. See COAL.

ALCOHOL. *Alcohol Consumption in the United States.*—A marked decline in the alcohol consumption in the United States is reported, amounting since 1888 to about 30 per cent. In other words the total consumption of alcohol in the United States is one gallon per capita less than in 1888, the total consumption having fallen off about 70,000,000 gallons since that date.

Alcohol in Therapeutics.—In the last published annual report of the Commissioners of Public Charities and Correction for the City of New York, which gives the facts and figures for 1893, the cost of liquors consumed and the death in the various hospitals under the control of the Commissioners suggests an interesting relationship: Following is the table compiled from the report:

HOSPITAL.	Number of patients.	Cost of liquors.	Deaths.	Cost of liquors per patient.	Percentage of deaths.
Fordham.....	383	\$274.38	44	\$0.72	11.49
Gouverneur.....	3,025	124.09	279	.41	9.22
Bellevue.....	16,141	2,969.75	1,592	.18	9.86
Harlem.....	2,842	356.53	130	.12	4.87
City (Charity).....	8,075	824.63	675	.10	8.35
Ward's Island.....	6,529	338.83	399	.05	6.11

There is a widespread feeling among physicians, frequently expressed during 1898, that alcohol is useful to a very limited extent as either food or stimulant.

Alcohol and the Russian Death-rate.—As a result of official inquiry, it is reported

that the Mohammedan Tartars of Kazan, who abstain from alcoholic indulgence, have a rate of mortality of only 21 per 1,000, while the death-rate of the Orthodox Russians of the same locality who indulge freely in alcohol but otherwise live under the same general conditions as the Tartars, is 40 per 1,000.

Alcohol Consumption in Various Countries.—In the *Lyon Médical* for December 4, 1898, Debove computes the average consumption of alcohol by the individual (man, woman and child) as follows: France, 14 pints; Belgium, 10.5 pints; Germany, 10.5 pints; British Isles, 9.25 pints; Switzerland, 8.75 pints; Italy 6.60 pints; United State, 6.10 pints; Sweden, 4.50 pints; Norway, 3 pints; Canada, 2 pints.

Influence of Experimental Alcoholism on Immunity.—Deléarde, of Paris, has been experimenting with tetanus and anthrax, and has found that animals treated with alcohol after they had been vaccinated, lost their immunity; if treated with alcohol during the vaccination period they acquired immunity with difficulty; if the vaccination was begun after the treatment with alcohol it was only successful if the latter was stopped at the beginning of the vaccination. In the case of anthrax it was impossible to immunize animals while they were being treated with alcohol.

ALEXANDER THE GREAT. See ARCHÆOLOGY (paragraph Babylonia).

ALEXANDRIA is the port of Egypt. It has increased greatly in recent years, both in population and in trade. In 1882 the population was 208,755, including Arabians, Turks, Jews, Copts, Greeks, and Franks. According to the census of June 1897, its population was 319,766. A new entrance to the harbor thirty feet deep was completed in July 1894, and navigation has been greatly facilitated by the building of docks, wharves and quays. In 1896 2,132 vessels arrived and 2,105 cleared. The tonnage of that year was 2,123,591 entered and 2,094,684 cleared, the tonnage of British vessels surpassing those of any other nation although the greatest number of vessels belonging to any one country were Turkish. In recent years Alexandria has exported large quantities of cotton and cotton seed, cane sugar, onions and maize, and its imports have comprised among other articles, cotton cloth, leaf tobacco, coal, iron, coffee, meal, starch and indigo. The Archæological Museum, which was opened at Alexandria on September 30, 1895, contains valuable collections, especially of coins.

ALPHONSO XIII, King of Spain; of the House of Bourbon, the posthumous son of Alfonso XII, was born May 17, 1886, and was enthroned December 1, 1887. His mother, the Queen-Regent, who was the Archduchess Maria Christina, daughter of Archduke Charles Ferdinand of Austria, is a woman of extraordinary tact and good sense. Ruling a country whose race, traditions, and language are not her own, she has won the love and admiration of the Spanish people for whom she has trained her son, the king, with the greatest care and devotion. The king has two sisters. Alfonso is a remarkably delicate child, but his health improves as he grows older.

ALGÆ. See BOTANY.

ALGER, RUSSELL ALEXANDER, Secretary of War in the McKinley Cabinet, was born in the township of Lafayette, Medina county, Ohio, February 27, 1836. By working as a farm hand he enabled himself to attend the Richfield Academy (Summit county, Ohio) during fall and winter terms; taught school two winters; studied law with Wolcott and Upson, Akron, Ohio, and in 1859 was admitted to the bar. He did not practise in his profession long, but, removing to Michigan in 1860, went into the lumber business on borrowed money. In September, 1861, he enlisted as a volunteer and the following month was mustered in as captain in the Second Michigan Cavalry. He was promoted to the rank of major, became lieutenant-colonel of the Sixth Michigan Cavalry, and in June, 1863, colonel of the Fifth Michigan Cavalry. At the battle of Boonsboro, Maryland, he was severely wounded, July 8, 1863; he was brevetted brigadier-general and major-general for "gallant and meritorious services" during the war; resigned from the service September 16, and was discharged September 20, 1864. He returned to Michigan and again with borrowed capital engaged in lumbering; he finally owned various extensive business interests both in Michigan and in other States. During 1885 and 1886 General Alger was Governor of Michigan, and on several occasions he has been recognized as a presidential possibility. On March 3, 1897, he was appointed and confirmed Secretary of War in President McKinley's Cabinet. During the latter part of the Spanish-American War and during the weeks immediately following the signing of the protocol (August 12), General Alger received severe criticism at the hands of the public and the newspaper press for alleged gross mismanagement and negligence in the War Department. It is doubtless true that the volunteers, as a rule, enlisted without adequate knowledge of the necessary hardships, including privations and disease, of camp life. Conditions however, seemed to be needlessly grievous. The unsanitary state of camps, the overcrowding of transports, the insufficiency of medicines and physicians, and the incompetency of many subordinate officers, caused a popular cry to be raised against General Alger and his department, and it was frequently suggested that the Presi-

dent ask him to resign the portfolio. He remained in office, but the President appointed a committee, without the power of subpoena, to investigate the alleged mismanagement of the department.

ALGERIA is governed by a civil governor-general who is in constant communication with the French executive department. He is the chief executive, but the departments of finance, worship, justice, instruction, and customs are under separate ministers, and a strip of territory in the Sahara is governed by military authorities under the direction of the governor-general. The census of 1896 gave for the three departments of Algeria a total population of 4,429,421. The area is 184,474 square miles. The Algerian Sahara is estimated to contain about 123,500 square miles with a population of about 50,000. Considering the fact that Algeria has been governed by France for more than sixty years, the French element is surprisingly small. In 1896 there were only 318,127 French inhabitants, while the other foreign residents exceeded these in number by over 100,000. The commerce of Algeria is for the most part with France and her colonies. It has shown no marked tendency to increase in recent years. In 1896, the "general" commerce of Algeria was for the imports 275,798,595 francs, and for the exports 247,409,742 francs. The "special" commerce in 1896, including imports for home use and exports of home produce, was for imports from France 269,237,968 francs, and for exports to France 231,074,677; and for imports from foreign countries 51,436,012, and exports to foreign countries 34,233,031. The carrying trade is largely in the hands of other countries than France. The railway mileage, which was in 1895, 1961, amounted in 1897 to 2,156. The main sources of revenue have been direct taxes, customs, registration, stamps, etc., and monopolies, and the main items of expenditure have been set down under the heads of the ministries of the interior, public works, justice, worship, and instruction. The chief part of the population is engaged in agriculture and the principal cereals raised are, in the order of their importance, barley, wheat and oats. In the mines, iron, zinc, lead, mercury, copper and antimony are obtained. Petroleum is found in Oran and there are phosphate beds in several parts of the country.

ALLEN, CHARLES HERBERT, Assistant Secretary of the Navy, succeeded Theodore Roosevelt in that position in May 1898. Mr. Allen was born at Lowell, Massachusetts, April 15, 1848; was educated at the Lowell High School and at Amherst College, being graduated from the latter seat of learning in 1869. He received from Amherst College three years afterward the degree of M. A. His political career began in Lowell where he engaged in mercantile pursuits and held various local offices. In 1881 and 1882 he was elected to the lower house of the legislature and the next year was sent to the State Senate and was subsequently appointed a colonel on Governor Robinson's staff. He was elected to the XLIXth and Lth Congresses by large majorities and then declined further nominations; but in 1891 was nominated for Governor of Massachusetts and was defeated by the late William E. Russell, of Cambridge. He was not in public life from that time until his appointment to the Navy Department. For many years he has been an intimate friend of Secretary Long. Mr. Allen is recognized as a man of much ability, but he entered the Department with no experience. He is a member of the Union Club of Boston and the University Club of New York.

ALLEN, JAMES LANE, American author, born near Lexington, Ky., in 1850. He was graduated at Transylvania University. The novels which have placed him in the front rank of American authors are: *Summer in Arcady* (1896), and *The Choir Invisible* (1897). In 1898 he was at work on a new book to be entitled *The Mettle of the Pasture*.

ALLIANCE OF THE REFORMED CHURCHES, an organization of ten Reformed and Presbyterian Churches in the United States. These are: The Presbyterian Church (North); the Presbyterian Church (South); the United Presbyterian Church of North America; the Reformed Dutch Church; Reformed German Church; Reformed Presbyterian Church; Associate Reformed Synod of the South; Synod of Reformed Presbyterian Church; and the Welsh Presbyterian Church. The number of communicants in these ten churches is 2,080,541, with a total constituency of 7,000,000. The Presbyterian Church in Canada, with a constituency of 600,000, and more than 80 different denominations from other continents, with a constituency of about 23,000,000, also belong to this Alliance. The Seventh General Council of the Alliance will be held in Washington, D. C., Sept. 27 to Oct. 6, 1899. The presiding officer will be Rev. J. Marshall Lang, D.D., pastor of the Barony Church, Glasgow, Scotland; and Rev. Wallace Radcliffe, D. D., pastor of the New York Avenue Church, Washington, D. C., will be chairman of the Committee of Arrangements. The Alliance is conducted by the Executive Commission, which held meetings in 1898 in Philadelphia, and St. Louis. The next meeting will be in Richmond, Va.

ALLMAN, GEORGE JAMES, M. D., LL.D., F. R. S., prominent zoölogist, emeritus regius professor of natural history at the University of Edinburgh, died November

24, 1898. He was born in Ireland in 1812; was graduated at Trinity College, Dublin, in 1844 and the same year became regius professor of botany in the university. In 1855 he accepted the chair of natural history at Edinburgh; resigned in 1870 and four years later became President of the Linnean Society. He was the recipient of various gold medals from the scientific societies, and in 1878 was honored with an LL.D. from Edinburgh; the next year he became President of the British Association. Among his publications are the monographs on *Fresh Water Polyzoa* (1856), and *Gymnoblasic Hydroids* (1871-72).

ALMA-TADEMA, LAWRENCE, painter, born at Dronryp, in the Netherlands, Jan. 8, 1836. He studied for a learned profession, but in 1852 went to Antwerp to study art. Since 1864, he has obtained medals, honors, and distinctions of all kinds. For many years he has lived in London. He was made R. A. in 1879. Some of his best works are owned in America, among them "Sappho" and "Reading from Homer." The "Conversation of Paula" (1898), is said to be his crowning production. (See PAINTING.) His wife is an accomplished painter and won a gold medal at Berlin in 1896; and his daughter Anna Alma-Tadema, took a second medal in the Paris Exhibition, 1889. Miss Lawrence Alma-Tadema, another daughter, has published *Love's Martyr*, *The Wings of Icarus*, *The Crucifix*, and *Realms of the Unknown* (poems).

ALSACE-LORRAINE constitutes the Reichsland or Imperial Land, the law of June 9, 1871, having declared that it should be forever united with the German Empire. The constitution of the German Empire was definitely introduced into Alsace-Lorraine on June 1, 1874. Its administration is under a governor-general, known as *Statthalter*, appointed by the Emperor. The seat of government of the *Statthalter* is at Strasburg. He is assisted in the government by a ministry of four departments, together with a Council of State. On October 30, 1894, Hermann of Hohenlohe-Langenburg, was appointed *Statthalter* in place of Prince Hohenlohe-Schillingsfürst. The new *Statthalter* followed the policy of his predecessor, trying so far as possible to propitiate the discontented element in the population. Nevertheless the opposition to German rule continued, being constantly stimulated from France, and measures were taken to restrict the press. In 1894 a notable reform was made in the administration of the communes, giving the latter a greater degree of local independence. Efforts were made to promote trade and industry in the country and an industrial exhibition was held in Strasburg in the summer of 1895. In 1898, when the Czar's peace manifesto was under discussion, a great deal was said about the opposition in France to any measure looking to permanent peace unless the Alsace-Lorraine question should be settled in a manner favorable to the French.

ALUMINIUM. The production of aluminium in 1898 amounted to 2,600 short tons as against 2,000 in 1897, and was controlled in the United States by one company which had an extensive plant at Niagara Falls. The principal directions in which the use of aluminium has increased in 1898 have been for electrical conductors, and in replacing zinc and brass in many of their ordinary applications.

The chief ore of aluminium is bauxite, the deposits in Georgia and Alabama continuing to be the source of this metal in the United States, although deposits are known to occur in Arkansas; those in Georgia and Alabama extend from Adairsville, Ga., to Jacksonville, Ala.; they do not form one continuous bed, but are found in lens-shaped masses whose geological position is immediately over the Knox dolomite, the bauxite having been derived from the Connasauga shale, which underlies the dolomite. All the deposits are located between 900 and 950 feet above sea level. The ore varies in character from a white clay to a pebbly mass, whose structure is known as pisolitic. The average composition of high grade ore is: Alumina, 61.68 per cent.; ferric oxide, 1.20 per cent.; silica, 2.10 per cent.; water (combined), 31.45 per cent.; total, 96.43. In addition the bauxite frequently contains several per cent. of titanitic acid. Heretofore one of the great obstacles to the more extended use of aluminium has been the difficulty encountered in attempts to solder this substance with copper. A German engineer, Wechnitz, has succeeded in plating aluminium with copper, by a welding process, in any desired thickness, and this even in the finest sheets allows of no separation when rolled or drawn. It is furthermore stated that the plated sheets can be easily soldered, grooved, tinned and nicked. This is an important discovery since the greatest obstacles to the wider use of aluminium have been its poor ability to solder, its weak power of resistance to numerous fluids, and the fact that paint does not adhere to it well.

ALVARY, MAX, German operatic tenor, who sang during many seasons in America, died at his home in Tabarz, Thuringia, Germany, November 7, 1898. Alvary was a stage name, his father being the well known scene painter, Andreas Achenbach. He was born at Düsseldorf in 1857. He sang somewhat when a youth, when he was known as a light tenor; subsequently, after leaving the university, where he did not finish the course, and after having become an architect and business man, he devel-

oped a strength of voice, under the direction of Lamperti in Dresden, and Julius Stockhausen in Frankfurt, that gave him a very high place among high class heroic tenors. His first appearance was made at Weimar in 1882; soon after he appeared in New York as "Don José" to Mme. Lilli Lehmann's "Carmen." From that time his success was assured, his popularity increasing until 1889 when he appeared as "Siegfried," which proved to be his master rôle. For this performance he was complimented on every hand, and no one praised him more than did M. Jean de Reszke, who, though perhaps superior to Alvary as a singer, is thought by some to lack the latter's natural adaptation to the part of "Siegfried." Alvary made several extended visits to America, his last public appearance being in the spring of 1896, when he sang in New York with Katherine Klafsky, under the direction of Mr. Walter Damrosch, with whom he had previously been associated. He enjoyed marked success in Europe. After leaving New York in 1891, he went to the Stadt Theatre in Hamburg, and, it is said, remained a member of the company as long as he could sing. Among the rôles in which he appeared are "Adolar" in *Euryanthe*, "Alvarez" in *Cortes*, "Merlin Assad" in *The Queen of Sheba*, "Loge," "Faust," "Walther," "Tannhäuser," and "Tristan." But he will be best remembered for his magnificent rendering of "Siegfried." Alvary, who was a man of much personal beauty, was always in his best days "dramatic, graceful, un-selfconscious." He was a conscientious artist, and, though by no means superficial, gave much care and attention to the minute details of his rendering. He is said to have had a singularly "simple, cheerful nature." In the latter part of his life, it is said, he was financially in very straitened circumstances. His wife and a number of children survive him; to him and Frau Alvary there were born thirteen children, some of whom are now dead.

AMERICA, FLORA OF. See BOTANY (paragraphs Systematic Botany, North America, South America, Ecology and Plant Geography).

AMHERST COLLEGE, at Amherst, Massachusetts, was founded in 1821. It is non-sectarian and for men only. In 1898 the professors and instructors numbered 36 and the students 380; the fellows and resident graduates numbered, 4; seniors, 89; juniors, 77; sophomores, 88; freshmen, 122. The following degrees were conferred at the commencement in June: B. A., 54; B. S., 31; M. A., 9; LL. D., 2; D. D., 1. The president, Merrill E. Gates, LL. D., tendered his resignation June 8, 1898, to take effect in April, 1899; President Gates was absent during the year beginning in April 1898, the executive duties being assumed by Dr. Edward Hitchcock, M. A. The college had in 1898 a permanent investment of \$1,402,404 and a beneficiary fund of \$240,000. The following departments were reorganized and enlarged: English Language, Rhetoric, and Public Speaking; French; German; and Biblical Literature; a new department of Modern Governments was instituted. In March 1898, the college suffered the loss of Henry Allyn Frink, professor of logic, rhetoric and public speaking. See Table under UNIVERSITIES AND COLLEGES.

AMICIS, EDMONDO DE. See ITALIAN LITERATURE (paragraph Fiction).

AMMEN, DANIEL, rear-admiral, U. S. N., (retired), died in Washington, D. C., July 11, 1898. He was born in Brown county, Ohio, May 15, 1820. He entered the navy in 1836; was executive officer of the frigate *Roanoke* during the Civil War; commanded the gunboat *Seneca* November 7, 1861, at the capture of Port Royal, where he distinguished himself. He was engaged in all the operations under Admiral Dupont on the South Atlantic coast, commanding the monitor *Patapsco* at Fort McAllister in March, and at Fort Sumter, April 7, 1863, and the *Mohican* during the two bombardments of Fort Fisher. Rear-Admiral Porter recommended him for promotion, and he became captain July 25, 1866. He subsequently became commodore and in 1877 rear-admiral, being retired in 1878. After the Civil War he designed the "Ammen balsa" to facilitate the landing of troops and field artillery on exposed beaches; he also designed a life raft for steamers, and a marine ram which has been adopted by the Navy Department. He published in 1891 *The Old Navy and the New*.

AMMONIA (from Garbage). See GARBAGE.

AMPERE, NEW DETERMINATION OF. See PHYSICS (paragraph Electro-Chemical Equivalent of Silver).

ANÆSTHESIA. *General.*—Schleich, of Berlin, has devised a mixture of chloroform, petroleum, ether and sulphuric ether, to be used for general anæsthesia, by inhalation. With it excitement during introduction is rare, and not marked at any time. There is no collection of mucus in the respiratory passages, no cyanosis. The pulse becomes full and regular, respiration remains unchanged, unless the patient is getting too much of the anæsthetic; then it becomes deep and very rapid. Patients anæsthetized by this mixture awake more rapidly. Half of them will walk home in an hour after recovering consciousness. They vomit much less frequently than when other narcotics are used. In Meyer's (of New York) cases but 44 per cent. vomited.

There is no consecutive bronchitis, no pneumonia. Albuminuria appears in only 4 per cent. This mixture is best administered on an Esmarch's mask, covered with oil-silk, and to which a small funnel has been attached.

Local.—Prof. E. W. Scripture, of Yale University, discovered that anæsthesia of the tissues resulted from sinusoidal electric currents of high frequency, the condition lasting a considerable period after the removal of the electrodes. See *PSYCHOLOGY, EXPERIMENTAL* (paragraph Yale University). Sensation of pain and the perception of cold or heat were abolished. Schleich, of Berlin, who undertook four years ago to devise a method of local anæsthesia that would employ cocain in a safe way and yet render it a competitor of the more dangerous general anæsthetics, was the inventor of the infiltration method. He uses graduated solutions of cocain, morphia and sodium chloride, mixed and injected in small quantities in adjacent areas after the entire surface which is to be the field of operation has been frozen with a spray of ether or ethyl chloride. By this method incision of abscesses, of boils, carbuncles and whitlows has been effected painlessly in many hundred instances, new growths have been removed, bones have been resected, teeth have been extracted and amputations have been made.

Eucain has been used with success in superficial operations, in 3 per cent. to 5 per cent. solutions.

ANAM or **ANNAM**, formerly an empire of southeastern Asia, is now a French protectorate, forming part of French Indo-China. As officially used, the name is applied to an ill-defined strip of territory extending along the coast of the China Sea with an area of 81,042 square miles, and with a population variously estimated at from 2,000,000 to 6,000,000. Since the convention with Siam in 1893 the river Mekong has formed the western boundary. For more than a century France has had relations with this country which at one time included six provinces of Lower Cochin China together with Tonquin, Tsiampa or Champa, and part of the ancient kingdom of Cambodia. The King of Anam formerly acknowledged the feudal overlordship of the Emperor of China. In 1862 he threw himself upon the protection of the French in order to put down a revolt of his Tonquinese subjects. The French wrested from him several of his provinces and continued to encroach upon his territory. In 1883 they decided to assert a protectorate over the land that remained and this plan was carried out by treaty in the following year. The country is fertile, producing rice, maize and other cereals, good timber and a variety of fruits and of vegetable substances useful in the industrial arts and in medicine. Its mineral resources are said to be important and include copper, iron, silver and a small quantity of gold. Raw silk is produced and there are manufactures of earthenware and coarse cloth. The principal exports are sugar and cinnamon. The capital is Hué, with a population variously estimated from 15,000 to 30,000. A garrison of French troops is maintained there. See *INDO-CHINA*.

ANARCHISTS. The anarchists have been active in recent years especially on the continent, but the United States has been comparatively free from their outrages since the famous Haymarket affair in Chicago. France has suffered severely. In 1894 one of the French newspapers published a list of eighteen anarchistic outrages which had been committed in the preceding ten years. It gave also a list of anarchist newspapers published throughout the world. The greatest number of these were published in Germany, France, and Italy. In the United States there were but two and one of these, that which Johann Most issued in New York, recently came to an end. Some of the principal outrages since the beginning of the year 1894 were as follows: Vaillant tried to throw a bomb into the French Chamber of Deputies on December 9, 1893. He was arrested and executed in the following February. Emile Henry was convicted of bomb-throwing in Paris on February 12, 1894, and was guillotined in the following month. Almost at the same time the Barcelona outrage resulted in the apprehension and execution of six anarchists who had been found guilty of an attempt at assassination and bomb-throwing. Next came the murder of President Carnot by an Italian anarchist at Lyons June 24, 1894. In Italy in August of the same year another anarchist confessed to the murder of an Italian editor. In March 1895, an anarchist named Olivieri threatened the life of King Humbert, and on his arrest was thought to be the man who five years before had thrown a threatening letter into the carriage of the Emperor William of Germany while the latter was visiting Rome. In January 1895, the Attorney-General of the province of Milan, Italy, Signor Celli, was murdered by an anarchist. Efforts were made in the different European States to suppress anarchists, and a movement has been set on foot from time to time to form some sort of an international agreement in order to deal more effectually with these criminals. In the United States a law was passed on August 16, 1894, for the exclusion and deportation of foreign anarchists. A good many outrages have been classed as anarchistic, although their connection with that movement has not been proved. In 1897 the list of murderous attacks on prominent people included the second attempt on King Humbert of

Italy, the murder of Canovas del Castillo, the murder of President Borda of Uruguay, and the assaults on President Diaz of Mexico and President Morales of Brazil, the latter assault resulting in the death of the Minister of War.

The assassination of the Empress of Austria (see **ELIZABETH EMPRESS OF AUSTRIA**) in September, 1898, again drew the attention of the public to the anarchists; and an international conference was assembled at Rome to consider the adoption of more effective measures against them.

The four points to be discussed by the powers, with the understanding that each power was free to propose others were: In the first place, Should Anarchists be considered as common law instead of political offenders? Secondly, Should the offenders be subject to extradition instead of being considered as at present, political refugees? Thirdly, The establishment of ways and means for suppressing anarchistic propagandism in the press; Fourthly, The establishment of an international system of European powers against the anarchists. The conference closed on December 21, 1898, but without publishing its results.

ANCIENT ACCEPTED SCOTTISH RITE MASONS are the Supreme Council of Sovereign Grand Inspectors-General of the Thirty-third and last degree. This is divided into two bodies: Northern Masonic Jurisdiction, with Henry L. Palmer, M. P., Sovereign Grand Commander, and Clinton F. Paige, Binghamton, N. Y., as Grand Secretary-General; and Southern Masonic Jurisdiction, with Thomas H. Caswell, M. P., Sovereign Grand Commander, and Frederick Webber, 433 Third street, Washington, D. C., as Secretary-General. These two bodies hold relations with the Supreme Councils in all countries of the world.

ANDREE, S. A. See **ARCTIC EXPLORATION**.

ANGIOSPERMS. See **BOTANY**.

ANGLICAN CHURCH. See **ENGLAND, CHURCH OF**.

ANGLO-AMERICAN ALLIANCE. In England a society known as the Anglo-American League, was founded in 1898 at Stafford House, the Duke of Sutherland presiding. The objects are to secure the "most cordial and constant co-operation" between England and America. Membership is open to British subjects and American citizens. When the Spanish-American war broke out, and there was some indication of a continental coalition to coerce America, a sympathy sprung up between the two great branches of the English race, and there was a mutual popular feeling that the common language, common blood, and essential republicanism in both nations pointed to an alliance of these foremost peoples of the earth. It was evident that the old animosities had for the most part disappeared and that a sympathetic alliance already existed, but a formal or political alliance in the near future seemed very improbable, although an English society was organized to bring about this result. It was recognized that permanent unions must be based upon common interests, ideals and aspirations, while the genius or spirit of government must in each case be the same. These requirements being so nearly met by England and America, the argument for alliance, in terms of expected results, were: "The supremacy of the Anglo-Saxon; the spread of constitutional government, based on an ever-broadening suffrage; the checking of the threatening aggressions of absolutism; the fostering of free speech and free thought through the world; the placing of the United States second to no commercial power; and, lastly, the securing of an ally which would prevent any continental power from meddling with American affairs." While it was recognized by all that a sympathetic alliance might be strengthened with profit to both nations and to humanity in general, one of the objections urged against a political, institutional, or governmental alliance was as follows: England is the chief factor in the "Concert of Europe" by which the *status quo* is maintained. To disturb the "Concert" even slightly would throw all Europe into political confusion and probably into war. England's interests would not permit her to leave the Concert, thus destroying the *status quo*, for the sake of American alliance. Political alliance for us, then, it was claimed, meant our entering into the *status quo* programme of monarchical Europe. And this, it was held, is not the business of a democracy. See the article **UNITED STATES** (paragraphs on History).

ANGLO-AMERICAN COMMISSION. See **CANADA** (paragraphs on History).

ANGOLA, or **PORTUGUESE WEST AFRICA**, lies on the western coast of Africa between the Congo Free State on the north and German Southwest Africa and British South Africa on the south, with a coast line of 1000 miles, an area of 484,800 square miles, and a population estimated at 4,119,000, though some authorities place it at less than half that number. Its capital is St. Paul d'Loanda and some of the important towns are Cabinda, Ambriz, Benguella, Novo Redondo, Mossamedes, and Port Alexander. The chief exports are rubber and coffee, and the chief products besides these include wax, sugar, cocoanuts, vegetable oils, ivory, oxen and fish. Among the minerals copper, malachite, iron, petroleum, and salt are found in great

quantities and gold is said to exist. There are over 200 miles of railway open for traffic and over 260 miles of telegraph line.

ANNUNZIO, GABRIELLE D'. See ITALIAN LITERATURE (paragraph Fiction).

ANTARCTIC EXPLORATION. In the spring of 1898 the Royal Society of England held a conference for the consideration of Antarctic exploration. It was soon rumored that the government was favorably disposed to such an enterprise and that it had approached, with a view to co-operative effect, not only the Australian colonies, but Russia, Germany, and Norway. No such combination, however, resulted, and about the middle of August an English expedition sailed from the Thames in the *Southern Cross*. This vessel, designed by Mr. Colin Archer, the builder of Nansen's *Fram*, has a displacement of 481 tons, is 146.5 feet long, and can maintain a speed of 9 knots; the bows, built of solid oak, are 11 feet thick, and the sides 3 feet thick in the weakest part; the whole is covered with American greenheart, and the ship, with the exception of the *Fram*, was said to be the strongest wooden vessel afloat. The expedition consisting of thirty-four persons and led by Mr. Carsten Egeberg Borchgrevink, an Anglo-Norwegian, included the following scientific staff: Sub-Lieutenant W. Colbeck, R. N. R.; Mr. Louis Bernacchi, of Melbourne Observatory; Mr. Herlof Klövstad, of Christiania University; Mr. Nicolai Hansen; Mr. Hugh Evans. The party was fully equipped for polar travel, the outfit containing a large supply of scientific instruments, small boats of the collapsible pattern, kayaks made in England, but in the Eskimo style, and seventy Samoyad dogs by which sledge-transportation was to be effected over the ice. The object of the expedition was scientific observation rather than the attainment of some farthest-south point or of the Pole. It was hoped in some degree to solve the problem of the "influence of this region on the climatology and meteorology of the world"; it was hoped that botanical and zoological study might reveal some of the former conditions of the region, and that important data might be attained in the field of geology and terrestrial magnetism. Borchgrevink sailed south from Hobart, Tasmania, December 19, 1898.

In the summer a Belgian expedition also sailed. It was commanded by Gerlach and sailed for Grahamland.

ANTHRAX. See SERUM THERAPY.

ANTHROPOLOGY IN AMERICA. Anthropology, the youngest of the sciences, can hardly be regarded as fully organized, despite the widespread interest in the subject and the increasingly voluminous contributions in all civilized countries. Its state of development is such that the more important contributions are those tending to define the science and establish its foundation. Recent contributions of this kind have been made in America, chiefly by three institutions, (1) the Bureau of American Ethnology, (2) the Anthropological Society of Washington, and (3) the American Association for the Advancement of Science. In the current classification of the science, recognized in the official ethnologic bureau, adopted as a basis for the sectional divisions in the second organization, and approved by different members of the third, seven major divisions are recognized, (1) Somatology or the Science of the Somatikos, (2) Psychology, (3) Estheology, (4) Technology, (5) Sociology, (6) Philology, (7) Sophiology or the Science of Philosophies. The five branches last named are sometimes combined for convenience under the term Demonomy—i. e., the science of system of the Demos, the artificial group of men. For special purposes, Somatology is somewhat extended to overlap portions of the fields of the other anthropological sciences so as to form Ethnology—i. e., the Science of the Ethnos, or natural group of men. The several primary divisions are sometimes sub-divided, perhaps the most important subdivision being that of technology into modern and archaic, when the latter is termed archæology. This classification is deemed important as a contribution to anthropology made within the last decade of the century, and also as a basis for the present article.

The Smithsonian Institution and National Museum.—We pass over the first years of American anthropology with a mere mention of such pioneer workers as Eliot and the Jesuits in the seventeenth century, Zeisberger, Heckewelder and Jefferson toward the close of the eighteenth, and Duponceau, Gallatin, Schoolcraft, Hale and Morgan in the first half of the present. The establishment of the study upon a secure basis in this country dates from the founding of the Smithsonian Institution at Washington in 1846, under a bequest of over half a million dollars, left in trust to the United States in 1826, by James Smithson, son of the English duke of Northumberland, "for the increase and diffusion of knowledge among men." Under the management of its first secretary, Joseph Henry, through a long administration of more than thirty years, the Institution grew and developed its usefulness until it became recognized as the leading scientific establishment of America, and perhaps of the world. It is now the central controlling force of several important scientific branches of the government service, including the Smithsonian proper, the Nationa'

Museum, the Fish Commission, the Astrophysical Laboratory, the National Zoölogical Park and the Bureau of American Ethnology. It is governed by a board of regents, including *ex-officio* the President, Vice President and members of the cabinet. Its chief office is styled the Secretary, the present incumbent, S. P. Langley, the third in line of succession, having entered upon his duties in 1888. The Institution is organized upon a broad basis and includes within its scope every department of science, but we shall treat here only of those relating directly to anthropology. Its great storehouse of study material is the National Museum, which had its original nucleus in the collections of the Wilkes exploring expedition of 1838-1842, and was first recognized by Congressional appropriation in 1858. It constitutes now the largest scientific depository in America and probably the third largest in the world. It is organized in three departments, of which anthropology—using the word in its widest sense—is the most extensive and important. The Museum has far outgrown the capacity of the present building, completed in 1881, and there is urgent need of a more commodious structure for the better housing and displaying of collections. The general collections of American archæology are displayed in the building of the Smithsonian proper. The Smithsonian library, most of which is at present accommodated in the Congressional library building, consists of more than 80,000 bound volumes, with pamphlets, periodicals, maps and so forth, aggregating altogether about 360,000 pieces.

The Bureau of American Ethnology.—From the beginning the Smithsonian Institution had given attention to anthropology, its first scientific publication, issued in 1848, having been an elaborate work upon the ancient remains of the Mississippi valley. Others of like character followed from time to time, and in 1876, by co-operation with the United States Geological Survey, of the Rocky Mountain Region, a series was begun under the title of *Contributions to North American Ethnology*, to embody the ethnologic results of the surveying and exploring expeditions then in progress west of the Mississippi. In 1879 the Bureau of Ethnology was established by Congress, as a branch of the Smithsonian Institution, for the special purpose of ethnologic research among the Indian tribes, particularly those of the United States. Major J. W. Powell, director of the geological survey, who had been chiefly instrumental in calling attention to the subject, was made director of the bureau, a position which he still retains, ably seconded by W. J. McGee, as ethnologist in charge. The bureau maintains a force of trained experts and gives assistance also to outside collaborators, in addition to affording them facilities for publication. The work consists chiefly of field investigations among the various tribes, supplemented by library research, the results being published in annual reports and in monograph bulletins issued at irregular intervals. More recently it has been found advisable also to undertake the publication of rare manuscript documents, especially those relating to the Spanish colonization in the southwest. Photographic work is done in the field and in the office, and the Indian portrait and landscape negative number now nearly 7,000. The field collections illustrating Indian art and life are deposited in the National Museum, where they constitute perhaps half of the aboriginal material. The Bureau has its own working library, including a number of rare volumes, and an invaluable linguistic library, consisting of about 1,600 manuscript vocabularies, glossaries and texts, largely gathered by its own workers and recorded in a special phonetic alphabet, making altogether the most important collection of American linguistics in existence. To secure the best results with the greatest economy of labor it was found necessary to map out the working field according to some systematic plan. While for museum or historical purposes the territorial or geographic arrangement may be preferable, for general ethnologic purposes it was found best to base operations upon a linguistic classification, which frequently also corresponds closely with the geographic scheme. In this way the investigator familiar with any one tribe can extend his researches with most advantage to cognate tribes wherever found. It was discovered that the hundreds of native languages in the United States and northward can be grouped into 57 stocks, some of which may hereafter prove to be related. The number of stocks or languages south of the Rio Grande is not yet determined. The ultimate purpose of the Bureau to include in the scope of its operations the whole American continent is emphasized by its recent change of title to the *Bureau of American Ethnology*.

Smithsonian Publications.—Following are the principal former and current publications of the Smithsonian, nearly all of which contain more or less of anthropologic material: *Annual Reports of the Smithsonian Institution*, *Smithsonian Contributions to Knowledge*, *Smithsonian Miscellaneous Collections*, *Annual Reports of the National Museum*, *Bulletins of the National Museum*, besides other special issues. The Bureau of American Ethnology has published in addition sixteen *Annual Reports*, ten *Contributions to North American Ethnology* and a series of bulletins, with other irregular issues. The complete list of Smithsonian publications numbers

several hundred volumes, which, as has been well said, "form in themselves a library which records the progress and illustrates the advance of knowledge in every field of human activity during the last fifty years."

American Museum of Natural History.—Second among the museum establishments of the United States is the American Museum of Natural History in New York City, founded in 1869, and maintained under a joint arrangement by which the building and current expenses are paid by the city while funds for collections and expeditions are supplied by the liberality of generous patrons, foremost among whom is the president, Morris K. Jesup, who has given special encouragement to expeditionary work. The present building was formally opened in 1877, and will be, when completed, the finest museum building in the country. The department of anthropology was regularly organized in 1894, with F. W. Putnam as curator, who still holds the position, dividing his time between this and the Peabody establishment at Cambridge. Besides its annual reports the museum publishes at irregular intervals a series of bulletins and memoirs, and maintains a course of lectures, with special reference to the needs of the teachers of the city and State. The library numbers now about 35,000 volumes. In the department of anthropology every man is an experienced field worker of established reputation, the result being apparent in the character and arrangement of the case material. Special attention is given to somatology, and ethnic traits are made distinct by means of life-size groups dressed, posed and equipped with careful fidelity of detail, all the figures being built up from actual photographs, casts and measurements. Three important explorations are now being carried on under the direction of the museum, viz: The Jesup North Pacific Expedition, along the coast region of British Columbia, Alaska and Siberia; the Bandelier explorations among the ancient remains of Peru and Bolivia, and the Lumholtz researches in the Sierra Madre region of Mexico. The first named is an extension of the work begun by Boas, and is expected to have important bearing upon the problem of Asiatic influence in American civilizations. The Bandelier explorations were inaugurated and carried on for some time by the liberality of Henry Villard, who donated the collections obtained to the museum, which now continues the work. Among the most important of the American collections may be noted: The Emmons collection from southern Alaska; the Peary collection from north Greenland; the Smith, Teit and Powell-Bishop collections from British Columbia; the Chenoweth and James collections from Manhattan Island; the Volk collections from the Trenton gravels; the Jones collection of southern antiquities; the Hyde and Mearns collections from the Pueblo ruins of the southwest; the Terry collection from California; the Lumholtz, Jesup and Saville collections from northwestern and Central Mexico; and the Garces and Bandelier collections from Peru and Bolivia; besides the noted Charnay casts of sculptures from the ruined cities of Yucatan and Central America, the gift of the duke of Loubat.

The Peabody Museum.—The Peabody Museum of American Archæology and Ethnology, established in connection with Harvard University of Cambridge, Massachusetts, was founded in 1866 under a bequest of the noted philanthropist, George Peabody. The present building was begun in 1876. The curator since 1874 has been F. W. Putnam, who also fills a university chair as "Peabody Professor of American Archæology and Ethnology," in addition to being curator of anthropology in the American Museum of Natural History. Under his direction there is a regular course in anthropology, consisting of lectures and special work, and supplemented by several endowments for the encouragement of anthropologic research, chief among which is the Thaw fellowship, now held by Miss Alice C. Fletcher, well known for her Omaha studies. There is a small museum library containing about 2,000 volumes, in connection with the university library proper. From time to time the museum publishes various ethnologic papers, in addition to its annual reports. Among the many valuable collections probably the largest and most important is that from the Hopi Indians of Arizona, obtained by Dr. J. Walter Fewkes while in charge of the several expeditions fitted out by the generosity of Mrs. Mary Hemenway. The material collected by Miss Fletcher includes some of the most sacred paraphernalia of the Omahas, in addition to costumes, utensils and native foods. Archæology is well represented from every section of the United States. There are valuable collections from the Santa Barbara Islands of California and the Salado ruins of Arizona, while the celebrated Calaveras skull and the Abbott collections from the Trenton gravels of the Delaware Valley have especial interest in connection with the question of the antiquity of man in America. There is also a fine somatologic collection of several thousand skulls and skeletons. Among the collections from the Latin American States the most notable are those from the ruined city of Copan in Honduras, and the Blake collection obtained from the graves of Arica in 1836, the first Peruvian collection ever brought to this country.



AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK, AS IT WILL APPEAR WHEN COMPLETED.

The Essex Institute.—This establishment deserves notice as a pioneer fosterer of anthropologic interest in America. Originating in collections brought from the South Sea Islands by returning ship captains, in which department it is perhaps unsurpassed in this country, its work is now devoted chiefly to the biology and archæology of Essex county, being in this respect a model of museum specialization.

University of Pennsylvania.—The University of Pennsylvania, at Philadelphia, maintains a chair of American Archæology and Languages, established in 1886, with Dr. D. G. Brinton as its incumbent. In 1889 the Museum of Archæology was organized, from which grew later (1891) the Department of Archæology and Paleontology. In addition to notable researches in the old world, successful explorations have been conducted in the Delaware valley, Pennsylvania, and in Florida and Bolivia. Of especial interest are collections of games and musical instruments, and of Pueblo and Peruvian antiquities. The museum sustains a course of lectures and publishes a quarterly bulletin.

Carnegie Museum.—This museum is a department of the Carnegie Institute of Pittsburgh, Pennsylvania, founded by the magnificent liberality of Andrew Carnegie and formally opened in 1895. It is under the supervision of Dr. W. J. Holland, Director, and although as yet in its infancy, bids fair soon to occupy a leading place among museum establishments. The collections include valuable material from Alaska, the southwest and South America. Plans are under way for systematic exploration, and a beginning has been made among the mounds of the upper Ohio.

University of Michigan.—This university, founded in 1837 and endowed as a State institution, has for several years past been giving attention to anthropology and conducts a regular course in American archæology. The museum possesses quite a valuable archæologic collection, and the beginning has been made, in coöperation with the Archæological Institute of America, of a systematic exploration of the ancient remains in which the State is particularly rich.

Field Columbian Museum.—The Field Columbian Museum of Chicago, Illinois, incorporated in 1893, had its origin in collections brought together for the World's Fair, the building being provided by the liberality of Marshall Field and other public-spirited citizens. It is well equipped in every department, with F. J. V. Skiff as director and George A. Dorsey as curator of the Department of Anthropology. It maintains a lecture course and includes among its publications a series of anthropologic papers. Expeditionary work is conducted in various parts of the world, chief among the American explorations having been those in Yucatan and southern Mexico, Alaska and the adjacent Siberian coast, and among the tribes of the western Canadian frontier. An important part of its working equipment is a fine physical and psychical laboratory. The museum has collections from every part of the old world, notably from Egypt, South Africa, Siberia, Assyria and Oceanica. Among North American collections the most important are the Bruce and other Eskimo collections; the Jacobson and Deans collections from the northwest coast; the Dorsey Blackfoot collection; the Ayer collection from the tribes of the plains and western United States; and the Moorhead collection of copper objects from the Ohio mounds. Mexico and Central America are well represented in casts, photographs and archæologic remains from the ruined cities. Of special note from South America are the remarkable Dorsey collection from the ancient graves of Ancon, Peru, and the splendid Hassler collection from the wild tribes of the Gran Chaco. In close touch with the museum is the University of Chicago, which conducts a course in anthropology, and has also some valuable collections of its own.

Trans-Mississippi Establishments.—Among the more western establishments which give attention to anthropology the most important is the Davenport Academy of Natural Sciences, organized at Davenport, Iowa, in 1867. It has issued several volumes of Proceedings, has a library of over 30,000 volumes, and a museum especially rich in archæologic material of the upper Mississippi region. The State Historical and Natural History Society of Colorado, with headquarters in the State house at Denver, was organized in 1879. Its collection of mummies and other ancient remains from the cliff ruins of the Mancos and Chaco cañons, the largest and most complete in possession of any institution, is in charge of W. C. Ferril, curator. On a suggestion of the society the patriotic women of the State have inaugurated a movement for the preservation of the more important ruins as a State reservation. In California there are valuable collections with the Golden Gate Park Museum in San Francisco, and the Historical Society of Southern California, in Los Angeles. Various other western State and territorial organizations have also begun work which promises well for the future. In distant Hawaii, now a part of American territory, the Bernice Pauahi Bishop Museum, founded at Honolulu in 1889 and now in charge of W. T. Brigham, director, is doing valuable work in the preservation and elucidation of Polynesian ethnology.

Canada and Latin America.—Of institutions outside the boundaries of the United States it is only possible to mention the names. In Canada the most important are McGill University, Montreal, which contains the Dawson ethnologic and archæologic collection; the Ontario Archæological Museum in Toronto; the Nova Scotia Institute of Science at Halifax; and the Provincial Museum at Victoria, B. C. In Latin America the principal are the Museo Nacional, in Mexico City, Mexico; Instituto-Físico-Geográfico Nacional, San José, Costa Rica; Museo Nacional, of Rio Janeiro, Brazil; Museo Nacional, Caracas, Venezuela, with Dr. Adolf Ernst, director; Museo Nacional, Santiago, Chile; and the Museo de La Plata, Argentina, in charge of Don Francisco Moreno.

Societies and Journals.—Among societies particularly devoted to anthropology and kindred subjects may be named the Anthropological Society of Washington, which publishes a journal called the *American Anthropologist*; the American Association for the Advancement of Science, which has a Section (H) devoted to anthropology; the American Folklore Society, publishing the *Journal of American Folklore*; the American Philosophical Society, of Philadelphia; the Archæological Institute of America; the American Antiquarian Society; the National Geographic Society, of Washington, publishing the *National Geographic Magazine*; and the various historical societies, together with the Canadian Association for the Advancement of Science, which is doing good work in its own territory. Of non-society journals devoted to the subject the principal is the *American Antiquarian*, published at Good Hope, Illinois.

The Year's Progress.—The most substantial evidence of the growth of popular interest in anthropology was the recent appropriation by Congress for an exhibit of native tribes at the Trans-Mississippi Exposition (see INDIAN CONGRESS AT OMAHA). Recent events have served to direct attention to Hawaii and the West Indies, as well as to the Philippines, and measures are already being taken for researches in those regions, under society or governmental auspices. The Christmas gathering of the A. A. A. S. and the American Folklore Society at Columbia University in New York were of special interest by reason of the number and importance of the papers presented. The second quinquennial award of the Loubat prizes for the best monographs, published in English within the three years preceding, upon subjects relating to North American archæology, ethnology or philology, was made at Columbia University on May 21, the first prize, of \$1,000, being given to W. H. Holmes for his work on *Stone Implements of the Potomac-Chesapeake Tidewater Provinces*, and the second, of \$400, going to Dr. Franz Boas for his monograph on *The Social Organization and Secret Societies of the Kwakiutl Indians*.

ANTIGUA. See LEEWARD ISLANDS.

ANTIMONY. The production of antimony metal in 1898, was 1,100 short tons as against 750 short tons in 1897. The two producers were the Mathieson Smelting Co., N. Y., and the Chapman Smelting Co., of San Francisco. Most of the metal was derived from imported ores, although some was mined in California, Nevada, and Utah. The old mines at Rowdon, Nova Scotia, were reopened, and new deposits are reported from France, which are said to be lead-silver bearing.

ANTIQUARIAN SOCIETY, AMERICAN, membership limited to 140. President, Stephen Salisbury; Secretary, Charles A. Chase.

ANTISEPTICS. See FORMALDEHYDE.

ANTWERP, INTERNATIONAL CONGRESS AT. See BELGIUM.

ANTWERP, NATIONS OF. See LABOR (paragraph Nations of Antwerp).

APPALACHIAN MOUNTAIN CLUB, an association of persons interested in the mountains of New England and adjacent regions, was organized in 1876 and in 1878 was re-organized and chartered as a corporation by the Commonwealth of Massachusetts. In 1898 the club had published, besides its regular periodicals *Appalachia* and *Reports*, twelve books and sets of maps of mountain regions. There is a library of over 1,000 volumes. Membership in 1898 was about 1,100. President, William H. Niles.

AQUEDUCTS. See CANALS (paragraph Aqueducts).

ARABIA is a large peninsula in the southwestern part of Asia with an estimated area of 1,230,000 square miles, although some estimates place it at about 1,000,000. There is equal uncertainty in regard to the population, which is variously estimated at from 4,000,000 to 12,000,000, the lower estimates being the more recent. It contains two provinces, Hedjaz and Yemen, which are under Turkish rule, and a wide tract of territory part of which is under British influence. The British influence, for instance, is exercised over Oman, an independent state in the southeastern part of the peninsula and extending for nearly 1,000 miles along the coast. Friendly rela-

tions have existed for years between the government of India and Oman, and Muscat is the seat of a British consul or political agent. Aden, a town and peninsula on the Arabian coast lying about one hundred miles east of Babelmandeb, is a British dependency and subject to the Bombay government. It is an important coaling station on the route to the east and comprises four towns, namely, Aden, Little Aden, Steamer Point, and Shaik Othman. Its trade is considerable and its population in 1891 was about 42,000. The Turkish provinces of Hedjaz and Yemen have together an estimated population of 1,050,000, and their combined area is 173,700 square miles.

ARBITRATION, INTERNATIONAL. Notwithstanding the Spanish-American War and various colonial hostilities throughout the world, the year 1898 was one of progress for the principle of international arbitration. More than ever before men of affairs began to think that this principle might be able in most cases to usurp war; and great hopes were expressed that arbitration would settle difficulties in their incipency and that thus the more severe strains between nations would be avoided. It is said that the movement has been prosecuted in various ways in almost all parts of the world; it chiefly expresses itself through the peace and arbitration societies. There is scarcely a place of any great importance in Germany, Switzerland, or Italy that has not one of these societies. In France the movement has been augmented largely through the French Society for Arbitration between Nations (*La Société Française pour l'Arbitrage entre Nations*) and a Woman's International League for Disarmament. In England the work has been carried on by various peace societies; the International Arbitration and Peace Association deserves special mention. Public sentiment in America, notwithstanding the fact of the war with Spain and the failure of the Senate in 1897 to ratify the British arbitration treaty, is strongly in favor of the peace movement. President McKinley has said, "the citizens of the United States have the right to be proud that their country is in the van in the efforts which are being made for international arbitration."

In June, 1898, a convention for the consideration of international arbitration, consisting chiefly of prominent lawyers, clergymen, and teachers, was held at Lake Mohonk. The following is quoted from the conclusions of this convention:

"In the following cases, several of which have been for the first time submitted during the year, controversies between nations have been under consideration by tribunals of international arbitration, viz.:

- (1) Great Britain and the United States, in the case of the Behring Sea damages claims.
- (2) Great Britain and Venezuela over the celebrated question of boundary.
- (3) Great Britain and France, over various questions of boundary in Western Africa.
- (4) Great Britain and Portugal, over the Delagoa railway dispute.
- (5) Great Britain and Portugal, over the Manica frontier.
- (6) Great Britain and Belgium, over the expulsion of an English citizen, Mr. Ben. Tillet, from Antwerp.
- (7) Great Britain and the United States of Colombia, over the matter of a railway built by British citizens in the territory of the latter.
- (8) Great Britain and the United States, over the Alaska boundary.
- (9) Great Britain and Germany, over the claims of the Denhardt Brothers in southeast Africa.
- (10) France and Brazil, over the French Guiana-Brazil boundary dispute.
- (11) France and Germany, over a question of boundary in the Hinterland of Togo, in West Africa.
- (12) Chili and Peru, over a boundary dispute.
- (13) Hayti and San Domingo, over a question of boundary.
- (14) The United States and Canada have just agreed to submit to a commission all questions in difference between them."

In the progress of the arbitration movement, one great difficulty has been recognized, viz., the attachment of a proper and trustworthy arbiter. Successful arbitration postulates an arbitrating authority that is "judicial in spirit as well as position and . . . entirely beyond suspicion either of fear, partiality, or corruption." Moreover, the arbitrating authority, it is said, should be permanent. As arbiter some great monarch has been suggested. Great monarchs, however, not only have little time for added judicial duties, but the untrustworthy knowledge and character of many of their advisers would render their decisions unsatisfactory. Some minor king, moreover, whose interests are not far-reaching, however capable he may be, is not in the eyes of the world an impressive person; and besides this his subjects would fear the resentment of some great nation against which the king might render a decision. The president of the Swiss republic has been suggested, the foreign interests of this country being so limited. A man like the recent chief magistrate, M. Numa Droz is probably able and worthy, but it cannot be expected that the Swiss can always choose a president who is a suitable international judge. The device of

Mr. Olney and Lord Salisbury in the Venezuela trouble, namely, two arbiters from the Supreme Court of each country, they having power to choose a fifth man, was generally regarded as fair; but such an arbitration commission would be manifestly unsatisfactory, not to say unfair, if one of the less dignified nations—a Spanish-American republic, for instance—should be involved. As international arbiter the Pope has finally been suggested, "who would presumably do justice, and who could not even be suspected of corruption." But it is clear that not even a man of the ability of Leo XIII could be entirely free, or at least thought to be entirely free, from creed prejudice; and moreover laymen have a suspicion, unwarrantable though it often is, of the clergy's ability in statecraft.

ARBITRATION, LABOR. A resort to arbitration in disputes between laborers and employers has often proved successful when undertaken in good faith. The value of this means of maintaining industrial peace is recognized in many States of the United States, whose legislatures have by law established boards of conciliation or arbitration, which are authorized to investigate the matters in dispute and to offer their services toward securing an adjustment. By some, compulsory arbitration of labor disputes has been proposed. This would make the decision of the board of arbitration legally binding. The objections to it are, first: the difficulty of forcing the laborer to abide by the decision, and, in the second place: the possible discouragement to the investment of capital under such conditions. In general it has been viewed as too serious a limitation of the freedom of labor contracts to be safely employed. An important law of the United States relating to the arbitration of labor disputes between common carriers engaged in interstate commerce and their employees was passed in 1898. This provided that in the event of a controversy between such common carriers and their employees the matter should be submitted, upon the request of either party to the controversy, to the Chairman of the Interstate Commerce Commission and the Commissioner of Labor. If these arbitrators are unable to secure a settlement, a controversy may be submitted to the arbitration of a board of three persons, one to be named by the employer, the other by the labor organization to which the employees belong, and the third to be chosen by these two. As to the binding nature of the award, it was provided (1) that it should be "final and conclusive upon both parties unless set aside for error of law apparent on the record." (2) That the respective parties to the award should each faithfully execute it. (3) That employees dissatisfied with the award should not by reason of such dissatisfaction quit the service of the employer before the expiration of three months from the making of the award, without giving thirty days' notice, and that the employer should not dismiss any employee within the three months without giving a similar notice. (4) That the award should remain in force for one year. A recent report published by the French Board of Labor concerning the extent to which arbitration was resorted to during the year 1897, shows that less than 25 per cent. of the strikes were submitted to arbitration.

ARCH. SEE BRIDGES (paragraph Arch).

ARCHÆOLOGICAL INSTITUTE OF AMERICA. The report of the President, Professor J. W. White of Harvard University, shows that the recent changes in the constitution have been of advantage in the closer connection of the affiliated schools at Athens and Rome, and in the greater stability of the Council whose power to transact business has been in no way hindered by the increase from 20 to 41 members. The annual meeting was held at Columbia University, New York, on May 14, 1898, and was well attended. A new branch has been organized at New Haven with 58 members and President Dwight of Yale University as its first president. The *American Journal of Archæology* has entered upon a new series, as the official *Journal* of the institute, and in spite of many difficulties has already almost made up the delay in beginning publication. The award of the Fellowships in the schools at Athens and Rome as a result of competitive examinations has already resulted in a distinct improvement in the qualifications of the students and a corresponding gain in the character of their work. The success of the schools has led to a movement to found a similar school for Oriental study in Palestine, and the institute has voted to receive such a school into the same relation as the other schools on its opening, which is expected to occur in the autumn of 1899. The chief work of the year has been the support of the excavations at Corinth (see ARCHÆOLOGY, paragraph Greece), while the interest of the local societies has been stimulated by lectures on archæological subjects. Very gratifying has been the increase of 219 in the membership, so that the institute now numbers 128 life and 705 annual members, with every prospect that the total will soon reach 1,000, a number needful to insure the proper progress of the work already undertaken. The reports of the affiliated schools show that at Athens 11 students were in attendance, a number only once exceeded in the past, while in maturity and attainments these members are decidedly superior. At Rome the value of the school has already been clearly shown, but the temporary character

of its financial arrangements has led to special efforts to secure a more permanent endowment from the alumni of the colleges most interested. The need of more complete preparation on the part of the students and of greater permanence in the resident staff has been emphasized by all the annual Directors.

ARCHÆOLOGY I. *Babylonia*.—In the exploration of the ruins of the ancient Assyrian and Babylonian empires the past year has not been marked by the publication of important results such as followed the excavations at Nippur. The year has been rather one of organization from which valuable discoveries may be expected in the near future. Near the beginning of the year a German oriental society (*Die deutsche Orient-Gesellschaft*) was organized for the exploration of the Tigris-Euphrates valley, Western Asia and Egypt, and an expedition was sent to Babylonia to determine upon a profitable site for excavations. The University of Pennsylvania has also sent out an expedition to continue the excavations at Nippur which have already yielded so much of value.

A new document relating to the Babylonian story of the deluge has been published by Father Scheil. It is merely a small fragment of a clay tablet, originally containing four columns of cuneiform writing on each side. What is preserved contains a part of the first, second, seventh and eighth columns in a much mutilated condition, but fortunately including the superscription of the scribe, from which it appears that the tablet was written in the reign of Ammizaduga, about 2100 B. C. In spite of the unsatisfactory nature of the text, it is clear that it deals with the subject of the deluge, already known from the version published by George Smith. The new tablet, however, is much earlier than the old version, and seems to have presented the version current at Sippara, where it was found. The name of Adram-khasis, applied to the survivor of the deluge in the old version, occurs in the new fragment, and it is probable that the god Ea, to whom the Babylonian Noah owed his safety, was introduced as remonstrating with the god Bel, who had planned to destroy mankind. Old as the tablet is, it is but a copy of a still older document. The information yielded by the cuneiform inscriptions does not relate merely to remote antiquity. In the annals of King Nabonidus for the year 547 B. C., we find a record of an expedition of Cyrus, which can scarcely be other than the one against Croesus, and from a study of Babylonian tablets, M. Jules Oppert has recently reached the conclusion that the death of Alexander the Great occurred in the temple of Bel-Merodach on Friday, May 11th, 323 B. C. Incidentally the same writer has endeavored to fix the dates of the Greek cycles of Meton and Callippus, placing the commencement of the former on July 28th, 433 B. C., and that of the latter on June 29th, 330 B. C. These calculations show that Alexander was born on Tuesday, July 23d, 356 B. C.

II. *Persia*.—In this country the French have obtained a monopoly of archæological exploration, and their excavations at Susa, where M. Dieulafoy made valuable discoveries, have been in charge of M. J. de Morgan, already well-known for his work in Egypt. No complete account of his work has appeared, but from his preliminary reports to the Ministry of Instruction, it seems that he has already secured important results. So far his campaign has been directed chiefly against the mound called the "citadel." The upper layers here yielded Persian and Arab pottery extending back to the Middle Ages; then were disclosed walls and pottery belonging to the period from 330 B. C. to 226 A. D. Of the Achaemenid period which should have appeared next, and to which Dieulafoy's discoveries belonged, few traces were found. The important discoveries were made about five feet lower, where remains of the very early period of the Anzanite kings were found. Here were found walls, probably of a palace, many glazed bricks, some 800 inscribed bricks, and also sculptures, both in the round and in relief, some of which bore long inscriptions, which in some instances are in archaic characters presenting great difficulties of decipherment.

III. *Egypt*.—Of recent years Egypt has been the country where excavation has been most persistently and profitably carried on. Indeed the attractions of this field have been so great that the government has at last appointed a committee on archæology, composed of foreign scholars in its service, which is to have control over concessions for excavating, and by its oversight prevent the destruction of valuable monuments and the many abuses sure to follow where such important work as the uncovering of ancient remains is left to untrained and often unprincipled excavators, who not only destroy recklessly but make no proper records of their discoveries.

At Thebes, in the valley of the Tombs of the Kings, M. Loret, the director of the department of antiquities, has discovered two more royal sepulchres. The first was that of Thothmes III, whose mummy was found some years ago at Dier-el-Bahari,—the other was that of Amenophis II. In this tomb not only was the body of the king still in its sarcophagus, but in a side chamber were found eight more royal mummies, which have been partially identified as those of Thothmes IV, Amenophis III, Sety II, Setnecht, and Ramses IV, VI, and VIII. The eighth mummy has been variously identified as that of Akhenaten and of Merenptah. Four human bodies, not em-

balmed but merely dried, were found in his tomb and from wounds which all bore in head and breast, the conclusion has been drawn that they were victims of human sacrifice, of which custom there are not a few traces in ancient Egypt.

The Egypt Exploration Fund carried on its excavations at Denderah, where Mr. Petrie hoped to find prehistoric remains. Though this hope proved vain, yet the history of the place was made clear. From the IVth to the XIth dynasty and again during the time of the Ptolemies and of Roman rule the place flourished greatly, but during the intervening period it seems to have been almost deserted, as scarcely any remains were found.

The Egyptian Research Account has been busy at Hierakonpolis (Kom-el-Ahmar), where Mr. Quibell has made most interesting and valuable discoveries, which tend to throw light on the earliest historical period in Egypt. Under a temple of the XIIth dynasty was found a mass of votive offerings of earlier times. Among these objects were a large bronze statue of Pepy I of the VIth dynasty, with a smaller one inside it, and a large hawk, with the body of copper, and the head of gold. The other remains were chiefly of the period of the first three dynasties, and include a fine slab of slate sculptured on both sides with the deeds of the king Narmer, and mace-heads covered with reliefs also dealing with historical subjects, as well as hundreds of figures in ivory and clay, plaques, cups and dishes, and flint weapons.

Early in the year it was announced that Amélineau, who has been digging for three years at Abydos, had found the tomb of Osiris, but more detailed information shows that the discoverer had not been so successful as he had supposed, and that his results, though interesting, are by no means startling. The slate cenotaph, which was the chief object in the tomb has proved to be of late date, and so good an authority as Maspero has expressed the opinion that there is no ground for the belief in the historical character of Osiris, and that the tomb is of the IInd or IIIrd dynasty.

Though no such sensational discovery as the Logia or Bacchylides (q. v.) has been recorded during the past year, still the first volume of the papyri from Oxyrhyncus, edited by Grenfell and Hunt, contains much of interest and value. Among the new literary fragments are some mutilated verses which are quite probably by Sappho, a portion of a work on Greek metre, a part of a chronological work relating to events between 355 and 315 B. C., and some bits of anonymous verse. There are also many fragments of authors already known, including a fairly long passage from Thucydides, which though yielding no new readings of importance, are of value as confirming the authority of our manuscripts. The greater part of the volume is naturally given up to the non-literary papyri, dealing with a great variety of subjects, and including not a few private letters, which afford interesting glimpses of the family life in the time of the Romans. Such are the letters in which a father informs a would-be son-in-law that the engagement is broken off, or in which a boy begs his father to take him to Alexandria, accompanying his request with distinct intimations of bad conduct in case of refusal.

IV. *Asia Minor*.—The rock tombs of Phrygia, already objects of great interest to archæologists, have lately been the subjects of careful investigation by Dr. Körte of Bonn, formerly the archæologist connected with the building of the Anatolian railway. He gives strong arguments for accepting two propositions. First, the so-called "grave of Midas" and other similar façades decorated with geometric patterns are not tombs, since they lack a burial chamber, but are really shrines of Cybele, or the ancient Phrygian god Midas. There are, however, seven rock-hewn tombs of the same general type. All these monuments are decorated in a style which shows the influence of the art of the Ionians of the coast of Asia Minor. This period of Greek influence extended from about 630 B. C., when the Lydians drove back the Cimmerian invaders, to 546 B. C., when the Persians under Cyrus conquered this region. Second, the other graves, which are formed by chambers hewn in the rock, and containing niches for the dead bodies, are at least 600 years later, and belong to the second, third and fourth centuries of our era, when under the rule of Hadrian and his successors Phrygia again enjoyed a period of prosperity, which is reflected in these costly sepulchres.

Preliminary reports on the excavations conducted by the Austrian Institute at Ephesus have appeared during the year. The results are not as yet very clear, though a fine market place some 70 metres square, surrounded by a colonnade, with a number of rooms, has been uncovered, and a number of pieces of sculpture, including a fine bronze statue of a youth, and some inscriptions have been found. The work on other portions of the site is still incomplete, but the theatre has already proved to be in a fair state of preservation, with stage-buildings containing two stories. In view of the importance of the city in Roman times there can be no doubt that the future reports of these explorations will contain much of interest.

From Priene, where the Berlin Museum has been at work, come reports which show that the ground plan of a Hellenistic city has been recovered. Not only have

the public buildings been laid bare, but the private houses have been found, in many cases still showing their decorations, which resemble those in the first period at Pompeii. The city was built on a steep side hill, and was laid out with great regularity, with broad streets running along the face of the hill on the terraces, and crossed at right angles by steep narrow lanes. The houses are all built around courts, connecting with the side streets by single doors. The market place contained the great altar of the city, and was surrounded by colonnades adorned with statues of bronze and marble, and in at least one instance containing important inscriptions. The theatre is very well preserved, with the exception of a considerable portion of the upper part of the seats for the spectators. The orchestra is complete, and contains an altar, not in the centre, where it might have been expected, but at the point farthest from the stage-buildings. These latter are in better preservation than in any other Greek theatre; the proscenium is in part standing, and there are remains also of portions of the second story. The building shows clearly the alterations which were made in Roman times in order to adapt the structure to the changed style in dramatic performances.

V. Greece.—Any account of archæological discoveries in Greece naturally begins with the work done by the Greek Archæological Society. The most valuable results of this body have been obtained at Thermon in Ætolia. One of the earliest discoveries was the great hill with a front of 130 metres, where the delegates of the Ætolian League gathered. More important, however, is the excavation of an ancient Doric temple, which must certainly throw much light on the early history of Greek architecture. The upper part was built of crude brick and wood; the columns were originally of wood, but these were later replaced by stone, as was the case in the Heræum at Olympia. The front had five columns, and the interior was divided by a row of columns into two naves. The cornice was decorated by alternate male and female heads, of which the former served as water spouts. There were found also fragments of painted terra-cotta metopes, showing colored figures on a light ground, and in technique bearing a strong resemblance to the painted vases. Although this building must have been erected in the seventh century, there are below it the foundations of two earlier structures, probably its predecessors.

At Eleusis A. N. Skias has discovered a very early necropolis, which had been hitherto undisturbed, and in which it is possible to distinguish six strata of interments. The pottery shows that this place of burial was in use from the Mycenæan period down to the time of the early Corinthian vases.

Thucydides tells us that when the Athenians purified the island of Delos in 426 B. C., they removed the dead to the neighboring island of Rheneia, and forbade future burials in the sacred soil. Recently excavations at Rheneia have brought to light the plot of ground chosen for the reinterment of the dead from Delos. In an enclosure, containing about 500 square metres, is a layer of bones about $\frac{1}{2}$ metre in depth. The bones have been placed in compartments formed by stone slabs set on edge and covered by flat stones. With the bones were found many fragments of pottery, from prehistoric times down to the period of Attic red-figured ware. There were also 30 stone sarcophagi, red-figured vases only, which probably contained bodies but recently interred, and therefore transported untouched.

The French school, the oldest of the foreign centres of archæological study in Greece, celebrated its semi-centennial on April 16-18, 1898. During the festivities two commemorative pillars each containing a bronze medallion, were unveiled and addresses were delivered by the director, M. Homolle, and representatives of the Greek government, the French Academy and the foreign schools.

The excavations at Delphi, which were begun in 1892, are fast nearing completion, and the publication of the results has begun in the *Bulletin de Correspondence Hellénique*, the origin of the French School. These publications make no claim to be a systematic presentation of the subject, and indeed it is as yet too early for any such attempt, but they bring to notice various phases of the work, and with the aid of the plan of the sacred enclosure, a good general idea of what has been accomplished may be obtained.

Among the discoveries at Delphi a prominent place is taken by the large number of votive offerings, some of which were monuments of large size. Such a monument was the bronze statue of a charioteer, which is one of the finest works of art yielded by these excavations. Other fragments show that the original group contained a quadriga, or four-horse chariot, with the driver, and one or two children who led the horses. Whether the owner of the chariot was represented in the act of mounting or was even in the group must remain uncertain. This monument seems to have been the offering of Polyzelus, brother of Gelo and Hiero, who dedicated it between 478 and 472 B. C. Other offerings of individuals or cities have been discussed by Director Homolle: 1. The column of the Naxians, erected about 550 B. C. This column was about 10 metres high and probably surmounted by

a colossal sphinx, thus furnishing a model for the representations of Œdipus and the Sphinx, which appear in various works of art. 2. The four bases which bore the tripods dedicated by Gelo and his three brothers in gratitude for the great victory of Himera, gained by the Sicilian Greeks over the Carthaginians in 479 B. C. 3. A large group of statues set up by Daochus the Thessalian, who was ambassador of Philip of Macedon. The group contained statues of Daochus and his ancestors for about 150 years, and later his son added his own statue and another to the row. 4. In a building near the temple once stood a famous group by Lysippus and Leochares, representing Alexander the Great rescued from a lion by Craterus. No trace of this work of art has been found, but on the rear wall of this little hall have been discovered the verses in which the monument was dedicated. 5. A more puzzling monument is a column in the form of an acanthus stem, surmounted by a group of three dancing girls, in short tunics and with the basket called calathiscus on their heads. This was the costume worn by the Laconian girls in their national dance, the Caryatis, while the character of the column on which they stand naturally suggests the city of Acanthus on the Chalcidian peninsula. The conjecture, therefore, is by no means improbable that the monument was erected by the inhabitants of Acanthus to commemorate their alliance with the Spartans which was the first-fruits of the expedition of Brasidas to the North in 424 B. C. 6. It is also announced that large fragments, sufficient for a satisfactory reconstruction, have been found, belonging to a monument set up by Aemilius Paulus, the conqueror of Perseus, the last King of Macedon, in honor of his victory at Pydna.

Of other works of art the reliefs, which once decorated the theatre, furnish interesting examples of provincial art in the second or first century before Christ. The scenes are chosen from the labors of Heracles, and the choice indicates that the cycle which is well known on Roman sarcophagi had not yet become fixed.

The inscriptions yielded by the excavations are very numerous, and promise to throw much light on the history of the Amphictyonic Council, and the temple of Delphi. Many of the documents relate to the accounts of the temple, and one stone has preserved the record of the earlier payments by the Phocians of the heavy fine imposed upon them at the end of the second Sacred War. An interesting fragment seems to show that the list of victors in the Pythian games compiled by Aristotle and Callisthenes, was so pleasing to the Delphians, that they not only thanked and crowned the authors, but ordered the work itself inscribed on the wall of the sacred building.

The German Archæological Institute at Athens has conducted some excavations on the island of Paros, where Dr. Rubensohn has uncovered a sanctuary of Asclepius, and two other places probably dedicated to Aphrodite and Eilethya, and traced the course of the city walls. Many inscriptions, some of considerable length, were found, and also architectural decorations and terra-cottas, though the most valuable discovery in the field of art was a fine and well-preserved archaic statue of the "Apollo" type. In Athens the investigations of the ancient aqueduct of Peisistratus and of the north slope of the Areopagus were continued, but attention was chiefly directed to the excavations near the ancient Agora, and these were rewarded by the discovery near the "Theseum" of the broad road which once led from the Dipylon gate to the market. These excavations are throwing much light on many vexed points in the puzzling field of Athenian topography, but it must be admitted that as yet the many questions raised have not received final answers, and indeed the ultimate solution seems to depend on information still hidden by modern houses.

The work of the British School at Athens has centred in the excavations on the island of Melos, where the trial diggings during 1896-97 resulted in showing that the island possessed great importance for the prehistoric Ægean civilization. The remains belonged to the pre-Mycenæan time, and included tombs, house-walls and a multitude of small objects, such as terra-cottas, pottery, and implements of stone, obsidian and bronze. Though no detailed account of the work in the last campaign has yet appeared, the statement has been made that one of the sites has already proved almost a second Troy, in the clearness with which are defined the strata of successive settlements. As the ground has been practically untouched, it is possible to distinguish three periods, while the great amount of pottery is certain to contribute to the solution of the vexed questions concerning the early civilizations of the Ægean.

The American School at Athens has continued the excavations on the site of ancient Corinth, which were seriously interrupted in 1897 by the war. Detailed plans and descriptions are not yet published, but the preliminary report of the director, Professor R. B. Richardson, shows clearly that the experimental period of the work has passed, and that a firm basis for the future has been gained, so that it is now only a question of time and money, though of the latter there is as yet unfortunately only a scanty supply. The work this year has

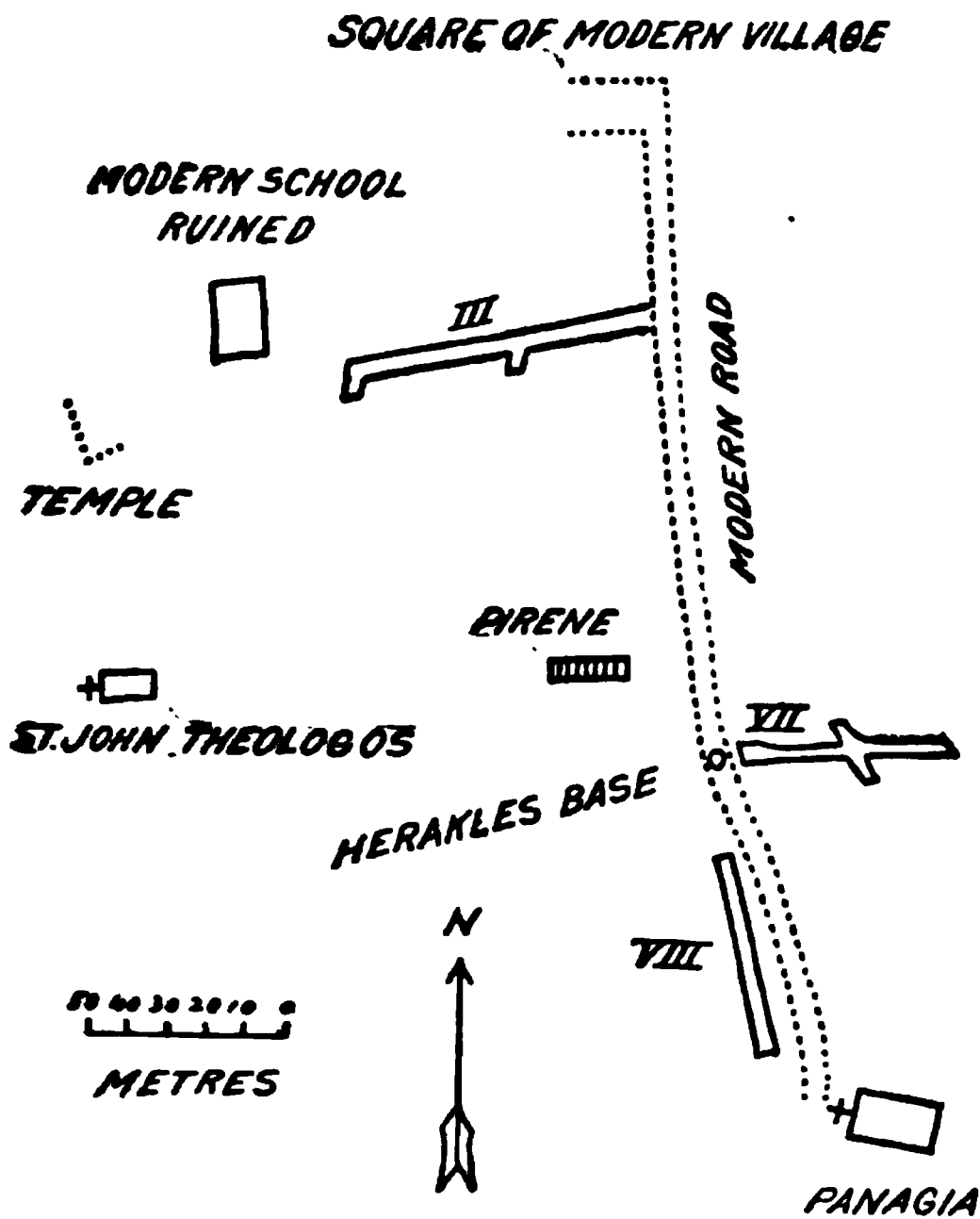


THE PYRENE AS IT APPEARS TO-DAY.

(Photography)

been confined within rather narrow limits, but has resulted in uncovering the foundations of a long building, probably a portico, and of an ancient paved road, which seems to end in a broad flight of marble steps leading up to the market-place. As the road can be traced in the opposite direction at several points there seems little room for doubt that this was the highway to Lechæum, the port of the city on the Corinthian gulf. The most important discovery, however, was the identification of the

fountain of Pirene, one of the most famous fountains in Greece, and a valuable point in Corinthian topography, since it was a little north of the market-place, on the road to Lechæum. The position of the market-place once determined, it is possible to give a name to the old temple, whose ruins have long been the most conspicuous land-mark of ancient Corinth. It is natural to identify it with the temple of Apollo which Pausanias mentions as on the right of the road leading to Sicyon. As the accompanying plate shows, the fountain was formed by cutting in the rock chambers at the rear of which was a channel from which the water overflowed. The front of the chambers was apparently faced with marble, and adorned by a portico with columns. It is said that three periods can be traced in the architectural remains, and that there is evidence for a much simpler delivery of the water through an arched channel before the elaborate spring-house was built. No important works of art have as yet rewarded the



American Work at Corinth.

(Courtesy of American Journal of Archaeology.)

excavators, though five large marble statues, unfortunately headless, and several reliefs, terra-cottas and architectural fragments have been found. Of the inscriptions, also but few in number, one belongs to the early days of the Corinthian alphabet, and another is interesting as being in all probability part of the lintel of the Jewish synagogue, for it bears the letters ΑΓΩΓΗ ΕΒΡ that is $[\sigma\upsilon\nu] \alpha\gamma\omega\gamma\eta \text{ Εβρ} [\alpha\iota\omega\nu]$. The great depth of soil which covers the ancient remains, and the valuable character of the land, which makes expropriation expensive, combine to make a thorough exploration of the site tedious and costly. Now that so fortunate a beginning has been made, it seems a duty to provide the means for further prosecution of a work which is certain to yield important additions to our knowledge of one of the most important commercial centers of the ancient world.

The number of foreign schools for archæological study in Athens has received an addition in the establishment of a branch of the recently founded Austrian Archæological Institute, under the direction of Dr. A. Wilhelm, already well-known as an epigraphist, and Dr. W. Reichel, the author of a brilliant work on Homeric weapons. Other representatives have been appointed at Smyrna and Constantinople, and the new school seems likely to take a prominent part in contributing to our knowledge of the remains of the ancient world.

The original representatives of that form of early civilization which is found so widely diffused in Greece, the islands of the Ægean and even further East, and which is known commonly as Mycenæan, still form the subject of discussion. While Helbig and some others seek the home of this very characteristic art in Phœnicia or Syria, Prof. Ridgeway has lately maintained that these remains represent the Pelasgian or pre-Homeric population of Greece who were conquered by the fair-haired Achæans, and in turn absorbed their conquerors, even as the dark-haired southern races had assimilated in later times the northern Goths, Normans and other invaders. On this theory the Pelasgian element predominated in Attica, Arcadia, and Thessaly, and in these regions we find marked traces of a different social and religious system from that revealed in the Homeric poems. This theory naturally

depends upon the discussion of a large number of minute details, and as yet has been scarcely more than outlined by its author, who promises a complete discussion in a forthcoming book on *The Early Age of Greece*. The relation of this people to Egypt has also been the subject of investigation, as recent discoveries in that country show that not only were Mycenæan artists influenced to some extent by Egyptian styles, but their wares were in turn imported to Egypt and in some instances inspired native Egyptian artists to imitation.

Another question which has long been under discussion also received a new contribution to its solution, in the recognition by Professor Dörpfeld of a new type of Greek theatre, which in his opinion corresponds very closely with the description of Vitruvius. To those who have accepted the recent theory that the Greek theatre contained no raised stage, but actors and chorus performed alike on the level of the *orchestra*, the explicit statement of the Roman architect has always offered a serious difficulty. The new type is prevalent in Asia Minor, and at first sight seems to resemble a Roman theatre, but on a closer inspection is seen to depart from the Roman model, in that the seats and orchestra form an arc greater than a semi-circle, the stage is always some distance from the diameter of the orchestra, varies from 8 to 10 feet in height, while the Roman stage was only about 5 feet high, and is distinctly narrower than was usual in a Roman theatre. This type probably was familiar to Vitruvius from the theatre of Pompey in Rome, which was copied from that at Mitylene. This view has of course been sharply attacked, but its author has defended his position with great clearness, and at present seems to hold the field.

VI. *Italy*.—While investigation and excavation are carried on in all parts of Italy under government supervision, the reports indicate that outside of Rome there has been comparatively little of importance discovered during the past year. In Sicily the work of Signor Orsi, extending over several years, has been largely confined to the uncovering of early graves, the contents and form of which furnish most of our knowledge as to the prehistoric population of Sicily. Orsi distinguishes four periods in this population, the first pre-Sicilian, the others Sicilian, with a distinct break between the pre-Sicilian and its successors. There is, however, as yet no agreement as to the latter point, others placing the gap between the second and third periods, calling the first two Sicanian the latter Sicilian, and others holding that the series is continuous. This last view has been maintained by Professor Petersen of the German Archæological Institute in Rome, who argues that the vase fragments show a regular development, as well as a survival of earlier forms in later periods, which is hardly likely if two distinct races are concerned. At Monte Tabuto, in southeastern Sicily, have been discovered prehistoric flint quarries, belonging to Orsi's first Sicilian period. In these low galleries had been excavated by means of stone implements and stakes of hard wood. Among the small objects found were flint knives, stone axes, and vases, some of which belonged to the transition from the first to the second Sicilian period. Tombs were also found in the neighborhood, sometimes hewn in the rock, and sometimes built of stone slabs on the surface of the ground. These latter were probably covered by mounds of earth. As remains of human dwellings are rare except in caves, it is of interest to note that the discovery is reported near Syracuse of the foundations of houses cut in the rock, along with flint fragments and pottery, but without traces of metal.

In northern Italy also our knowledge of the prehistoric civilization has been increased by the publication and discussion of the results of excavations carried on many years ago in the necropolis of Remedello Santo in the province of Brescia. This place contains not merely tombs belonging to the Gallic and early Roman time, but also remains of the pre-Gallic population, including graves and traces of dwellings of the neolithic age, as the period of transition between the later stone and the bronze ages is called. In this period the dead were buried (1) in caverns, either natural or excavated, and (2) in graves in the open fields. In the neolithic age natural caverns were sometimes used, and also graves in the open field frequently formed of stone slabs. In both periods there are often indications of a second burial, sometimes accompanied by coloring the bones of the dead. The burial rites and the objects laid by the dead were the same in both periods, except that no metal is found in the neolithic time. It is therefore natural to suppose that there was no change in the race occupying the country, only a more advanced stage of civilization due to the introduction of metals.

The whole system of chronology devised by Montelius, which has commonly been accepted for the duration of the Etruscan civilization, has been vigorously attacked by Dr. G. Karo with arguments which seem weighty. Montelius held that the Etruscan civilization extended from about the fourteenth to the sixth century before Christ, and could be divided into nine periods of about one hundred years each. Karo first attacks the close of the period and seems to show that this peculiar civilization could easily have lasted well into the fifth century. The other limit, based on Mycenæan vases found in Sicily is also un-

certain, as the date of this style of decoration is not yet determined with accuracy. The objects found in the rich Etruscan tombs, such as the Regulini-Galassi tomb at Praeneste, are in their style of decoration much more closely related to the art of the late seventh than to that of the ninth century. According to Karo four periods can be distinguished: (1) The ninth and early eighth centuries, when no Greek influence is seen, and pit graves were in use. (2) The eighth and first part of the seventh, when trench graves are found containing imported vases and bronzes with geometric decoration. (3) The latter part of the seventh and early sixth centuries, when the first great Greek importations are found with decorations under Oriental influence. This is the period of the circular and corridor tombs, with their rich contents. (4) The sixth and fifth centuries, marked by a further great Greek importation, showing especially the development of the black-figured vases. This is the time of the chamber tombs.

The chief results of the year in Italy have been obtained in the Roman Forum, where the government has entered on the task of setting in order this somewhat neglected spot. The mound of earth covering the temple of Vesta, and supposed by some to be in part due to the reconstruction of Severus, has been removed, thus bringing to light the steps of the temple, and some interior walls. It is interesting to read that deep in the foundations was found a small fragment of a Greek vase, made about the middle of the fifth century, and probably of the kind used in the service of the temple. Two more interesting discoveries have been made by Signor Boni. The first is that of the spot where the body of Julius Cæsar was burned. When Augustus built the temple of the divine Julius, he did not cover this place, but left a semi-circular recess in the front of the podium, and there on the original travertine pavement are the remains of the base belonging to the column erected to mark the site. The other discovery is the uncovering near the Comitium of a pavement about twelve feet square paved with black marble slabs, and enclosed by a travertine curb. This must be identified with the black stone marking the grave of Romulus, or as other ancient writers said the grave intended for Romulus but used after his death for Faustulus and Quinctilius. Not only have these excavations been made, but much has been done toward improving the appearance of this centre of the ancient city by reconstructing such monuments as can be restored from their fallen fragments. No conjectural "restoration," usually so misleading, seems to have been allowed, and the result can only be welcome to lovers of ancient art.

VII. *Switzerland and Germany*.—Roman remains in Switzerland are by no means rare, but the discovery recently made at Baden near Zurich is unique. According to the reports this is nothing less than an ancient hospital, with fourteen rooms, in which were found surgical instruments of many kinds, as well as spoons and measuring vessels, jars and bottles. As two legions were stationed here it seems likely that this is the military hospital, and as no coins later than those of Hadrian have been found, it is probable that it was abandoned during the second century. Surgical instruments, and medicine jars are no great novelty—the House of the Surgeon in Pompeii is well-known—but a hospital system among the ancients has been much debated, and a military hospital was unknown, even from literary sources.

In Germany the chief work of exploration is still devoted to the *limes*, the Roman boundary wall carried from the Rhine to the Danube, as an earthen rampart with frequent towers a short distance back, and at greater intervals fortified camps. In spite of the apparently perishable character of the work, it has been traced over a good part of its course and many of the forts and towers uncovered. The silver treasure found long ago at Hildesheim, and preserved in the Berlin Museum has lately been carefully studied and the fragments united, so that the original appearance of the vessels has been in large measure restored. The style is too simple to have attracted the German taste of the early imperial time, and yet they were found far from any Roman post. In number and character they seem to be suitable for a table service for three persons, and probably formed the traveling set of some Roman officer of high rank, though not the very highest, who in some moment of peril buried his treasure. The style of the vessels indicates the taste which prevailed in the Augustan age, and there seems nothing to require us to assign any vessel to a later time.

VIII. *France, including French Africa*.—At Martres-Tolosane, about 40 miles above Toulouse, there has been discovered what was at first reported as a Roman city. Further details seem to indicate that it is merely a collection of villas, 10 in all, within an area of about 35 sq. km. One of these is of unusual size and richly adorned with sculptures of the first and second centuries of our area. These decorations are not merely architectural, but include 70 statues, a number of small reliefs and 65 busts of emperors and nobles from the time of Augustus to that of Gallienus. The other villas yielded less interesting results, but there seems good reason to believe that in the large villa has been discovered the residence of the procurators in charge of the imperial property in the upper valley of the Garonne.

In Tunis the work of exploration, under the supervision of the French Academy, and the government, goes steadily forward. The discoveries announced during the year have centered near ancient Carthage, where in 1896 Father A. L. Delattre excavated, at Bir-ez-zitoun, a cemetery containing successive layers of graves from the end of the Republic, soon after the foundation of Roman Carthage, to the second or perhaps third century of our era. In some of the earliest graves were found sculptured *stelæ*, of a type hitherto supposed to be Punic, and this similarity to the pre-Roman work extended to some of the vases and lamps. The later tombs are marked by a sort of cippus, connected by an earthenware pipe with the cinerary urn beneath, so that the liquid offerings to the dead might thus flow to those below the earth. Below these urns were found many small objects of metal and terra-cotta, including a number of copper coins. As the latter were obviously of much earlier date than the graves in which they were found, it looks as if the thrifty Romans paid Charon's fee in coin no longer current in the upper world. The same excavator has reported more promptly on his discoveries in another village, Bordj-Djédid, near Carthage, where the Punic necropolis has been found, and many tombs opened. They are in the form of rectangular pits containing one or more chambers, and resemble the graves of Sidon. A large number of fragments of sculpture, coins, terra-cottas, and small objects in metal were found, and also two sarcophagi, one having the figure of a bearded man in high relief on the cover, and the other with the inscription, "Baalchillek the Rab." Other tombs in the same neighborhood have yielded more small objects, including some Greek terra-cottas, and the soil above the graves has furnished the longest Punic inscription from this neighborhood, a dedication to Ashtoreth and Tanit of Lebanon of certain sanctuaries and their contents, which are carefully noted. As these excavations are by no means complete, new discoveries from the old Phœnician city may be expected. To the Virgil mosaic and other specimens of African art, have been added two of decided interest. One from the neighborhood of Carthage is of large size (7m.x5½m.), and shows in the centre a sacrifice by six hunters before a temple containing statues of Apollo and Diana. Around this design are smaller fields with hunting scenes. The other comes from near Medeina, and is cruciform. The arms are occupied by a head of Oceanus, a reclining river-god and marine views, and the centre by a picture of 25 ships sailing on a blue sea. Each ship bears the name of its type in Latin, and sometimes in Greek, and there are a few appropriate Latin verses, some of which are new. Eight of the types of the ships are new, and fifteen more were previously known only by name.

IX. *Spain*.—Late in 1898 the Louvre announced the reception of a very remarkable piece of sculpture from Elche (ancient Ilici) in Spain. It represents a woman in the native costume, with the curious wheel-shaped ornaments covering the ears, as Strabo describes them in his account of the strange fashions prevailing in Iberia. The head shows distinctly the influence of the later Greek archaic art, and more especially that of Ionia, which is to be expected, as the Greek colonists in Spain were Ionian. This same influence is noticeable in some small bronzes from the neighborhood of Cerro de los Santos, which also show the women with heads covered by veils which, however, do not conceal the characteristic ornaments over the ears. As the head from Elche is of native stone, it may be the work of a native artist familiar with the work of his Greek neighbors, or possibly of a wandering Greek sculptor. Its date is uncertain, but it cannot be earlier than the fifth century, and may well belong to the end of that period.

X. *England*.—The most important archæological researches in England for some years have been the excavations of the old Roman town at Silchester, which have been conducted systematically for six months in each year since 1890, and have already laid bare about one-half of the site. The fact that the land is under cultivation makes it necessary to replace the soil at the end of each season, but very careful plans and drawing are prepared, and all objects found are removed to the Reading museum. As the ancient streets can be traced by the poor growth of the crops above them, the town has been divided into blocks or *insulae*, and these are being examined in regular order, the south-west portion of the area being the section chosen for 1898. Besides the usual smaller houses, a large dwelling with nearly perfect heating apparatus, or *hypocausts*, was found, and in its courtyard the traces of an earlier house. Indeed it is by no means unusual to find evidences of alterations and rebuilding, natural enough during the long period of habitation, for the architectural fragments are said to show that the town existed from the time of the Antonines to the very end of the Roman occupation. It is supposed that the site represents the town, called in the Antonine itinerary Calleva Atrebatum, but as yet no inscription has been found to throw light on the name or history of the place; indeed the epigraphic results of the investigations have been most disappointing.

ARCHÆOLOGY (AMERICAN). Until about 1880 archæologic inquiries in America were conducted in accordance with ideas developed by European students;

then, with the extension of ethnologic researches among the native races, original ideas took shape, and the method of interpreting prehistoric relics through observation of primitive peoples was gradually substituted. With the adoption of the improved method, it was perceived that archæology can hardly be regarded as a distinct science, but rather as that branch of technology dealing with prehistoric products of æsthetic and industrial handicraft. Through these advances, archæologic inquiry in America received great impetus and began to yield the results summarized in the following paragraphs:

Mounds and Earthworks.—The researches of Thomas and others have shown that the artificial mounds and other earthworks of the Mississippi valley are in no way different from earth-structures sometimes seen in process of erection by early explorers, and contain no artifact types distinct from those found in use among the Indians (except beads of Venetian glass, hawk-bells of alloyed metal, and other objects of European origin found in a few of the tumuli;) accordingly it has been made clear that these structures are not the work of ancient peoples of high culture as once supposed, but of Indians corresponding in culture and habit to those found in the region by the settlers. Some earthworks are of geometric form, including circles and squares, but careful surveys have shown that the accuracy of the figures was overestimated by some early observers, and is of a degree readily attainable by Indians of average intelligence. Many of the upper Mississippi mounds are in the shape of animals, outlined in low relief on greatly magnified scale; some of the forms have been thought to represent extinct species, though the supposition is hardly borne out by careful measurement and analysis; these effigies appear to represent the totems or beast-deities of the tribes occupying that region up to the advent of the white man. The crania and other osseous remains found in the mounds have been shown by Putnam and others to present a considerable variety in type, ranging from dolichocephalic to brachycephalic; but the cephalic types have not been identified with distinct tribes or groups of aborigines. Remarkable earthworks have been brought to light by Cushing in southwestern Florida; some of these are mere refuse heaps accumulated beneath and about pile-supported habitations, and are significant in suggesting the origin of the custom of building mounds as sites for houses and temples in lowland districts; others, both on the insular keys and the mainland, are built of carefully-laid shells in such manner as to afford sites for villages, with canals and harbors for watercraft. Relics of the builders, preserved in remarkable perfection in the adjacent tumuli and muck-beds, betoken a high stage of aboriginal culture, corresponding to that noted by the earliest Spanish explorers, yet suggesting affinities with the aborigines of the Antilles and South America, as well as with more northerly tribes; symbolic devices abound; the implements are chiefly of tooth, shell, bone, and wood (reminders of the culture stage called "prelithic"); the watercraft were wooden canoes so large as to imply perfected social organization, and doubled for sea-going; while the graphic devices and other symbols record ceremonial institutions and fiducial customs related to those found among well-advanced tribes in other parts of the country. The shell-mounds or *mi dens* of the Atlantic and Pacific coasts have yielded abundant aboriginal material, throwing light on the habits and customs of the native tribes; during the last half of the decade, those of Chesapeake bay have been examined by Holmes, those of Maine by Powell and others, those of British Columbia by Boas, and those of Sonora by McGee; a remarkable midden (forming Punta Antigualla in the Gulf of California) in the land of the Seri Indians, covering 75 acres to a height reaching 90 feet, although largely cut away by the sea, is of peculiar interest in that the contained artifacts, alike from summit to base, represent the exceedingly primitive culture of the savage Indians still inhabiting the region. The artificial mounds of the arid plains in southwestern United States and northern Mexico, explored by Mindeleff and others, contain remains of aboriginal villages and temples related to those still extant in the same region; the associated ancient cemeteries explored by Fewkes have yielded unprecedentedly rich collections of symbolic pottery.

Stone Art.—During the decade 1885-1895, Holmes investigated the aboriginal methods of quarrying, manufacturing stone implements and utensils, and distributing the artifacts; the principal area of study was the middle Potomac region, though the inquiries extended throughout the United States. The quarrying operations of the Indians were extensive; in different localities the stripping reached acres; in North Carolina, Virginia, and Maryland steatite veins were worked (for soapstone utensils) to depths of 20 to 50 feet; in the Lake Superior region mines for native copper were sunk over a hundred feet. The pebble beds of the Potomac formation about the site of Washington were worked largely for quartzite pebbles and cobbles; these were rough-dressed on the quarry-sites and the product (long known as *palæoliths*) transported to shop-sites for final shaping into blades used as knives, arrowpoints, spear-heads, etc.; while the finished implements were distributed by exchange and the exigencies of war and chase. These processes traced in the District of Columbia were

afterward found characteristic of other provinces and of various living tribes. The inquiry demonstrated that the European classification of stone artifacts, and corresponding division of prehistoric time, as palæolithic and neolithic, cannot be applied to America; and Professor Holmes' investigation attracted wide attention, and brought him, in 1898, the first Loubat prize awarded decennially for the most notable contribution to archæology and ethnology. Guided partly by the prehistoric and modern stone work of the Seri Indians, McGee followed Holmes' demonstration with the classification of American stone artifacts as (1) "protolithic," and (2) "technolithic;" the first class being devoid of mechanical design, and comprising stones of natural form chosen at random or through the suggestion of myth and shaped as an incident of use, while the second class were shaped purposely in accordance with antecedent design. The two types, together with the type of artifacts called "prelithic" by Cushing, stand for stages in cultural development among given peoples, though they existed contemporaneously among different groups at the advent of the whites and the opening of written history. Besides the implements and weapons of hard and tough stone, the Indians left in their tombs various symbolic or ceremonial objects, including pipes, gorgets, beads, and pendants, often carved from slate, steatite, catlinite, and other soft stones, as well as trays, pots, and pannikins of steatite; while in many districts stone mortars and pestles were common, as were metates and manos in southwestern United States and Mexico. The mortar district of the northern Pacific coast passes into the metate district of the southern coast in California, where a series of transitional types (partly protolithic) were brought to light in 1898.

Metallic Artifacts.—From mounds and graves and surface finds, prehistoric implements and ornaments of metal have been obtained in considerable numbers. The most abundant metal is native copper, which was forged cold or at low heat into tools or weapons imitating those of stone in form, or into various symbolic designs. In southwestern United States and also in Mexico, Central America, and South America, native silver and gold were similarly wrought; in the more southerly districts these metals sometimes were worked hot and even partially fused; but no decisive evidence has been found that the aboriginal Americans understood smelting or alloying. In the Mississippi valley and elsewhere meteoric iron (which is usually hot-short, and thus workable only cold) was evidently prized highly for ceremonial objects; and in Mexico and elsewhere mirrors of polished nodules of pyrite were used apparently as insignia.

Evidence of Human Antiquity.—Up to 1880, American archæologists were impressed by records of human relics associated with geologic deposits in such manner as to indicate the high antiquity of man on the western hemisphere. The instances were critically examined, chiefly by Holmes and Brinton, and the supposed evidence was found untrustworthy in nearly all cases and doubtful in others; the quartz chips reported from deposits of glacial age at Little Falls in Minnesota were seen to be either superficial or lodged in a talus; similar conditions existed at Trenton, where also the artifacts have been shown by Holmes and the crania by Russell to belong to types represented by the local Indians at the time of settlement. In 1898 Holmes and McGee visited the Calaveras region in California, whence the strongest suggestions of high human antiquity had come, and found that most of the artifacts reported from the auriferous gravels were of stone more recent than the gravel formations, and were of the specialized type used by existing Indians and scattered by them over the surfaces subsequently disturbed by the hydraulic mining operations. Researches in the caves of eastern United States by Mercer and Cope also failed to reveal such association of human remains with those of extinct animals as are frequently reported from Europe. On the whole, it seems probable that America was peopled by the ancestors of the Indians some thousands of years ago, perhaps soon after the melting of the last Pleistocene glaciers; but there is no decisive evidence of man's existence in America during any geologic age beyond that called Recent or Modern.

Habitations and Temples.—In southwestern United States structures of stone and adobe, like those of modern Pueblos, together with cliff houses and cavate lodges (excavations in soft layers in the cliffs) have been described by Powell, Mindeleff, and others; associated with these, as with the modern structures, are kivas or subterranean temples containing ceremonial articles and other relics serving to establish a genetic relation between the prehistoric folk and those of the present. In 1897 Hodge ascended Mesa Encantada in New Mexico, long regarded as inaccessible, and verified an ancient tradition of the neighboring Acoma Indians by finding distinctive artifacts scattered over the summit. A southwestern relic of especial note, as the largest prehistoric adobe structure in the United States, is Casa Grande ruin, near Florence, Arizona; it has been reserved recently by the government and placed in charge of a custodian. Among the most imposing aboriginal habitations and temples of the western hemisphere are those of Mexico and Central America, especially those of Yucatan; between 1890 and 1900 new light has been thrown on Yucatan

ruins through researches by Maudsley, Holmes, and others, while the prehistoric structures of Honduras have been investigated energetically through the efforts of Putnam and his collaborators. Maudsley and Putnam have published elegant and faithful reproductions of decorative and other features of the singularly ornate structures; while Holmes has issued effective panoramas of the ruined cities of Yucatan and the valley of Mexico, giving clear conceptions of their extent and indicating architectural motives. Throughout America, the greatest structures were temples for fiducial ceremonies (even the best-organized aboriginal governments being essentially fiducial;) the architectural methods exemplified the earlier stages in the development of the arch and other structural motives; the implements employed in the stone-carving and stucco-molding were of stone and wood, no metal being employed as material and little if any as constructive appliances.

Prehistoric Surgery.—About 1890, Muniz made a rich collection of prehistoric crania in Peru, many of which were trephine; they were studied by the collector and later by McGee. These and other trephined crania from Peru and one obtained by Humboldt from Mexico, with material from other countries, show that one of the most delicate and difficult operations of modern surgery was even more common among some prehistoric peoples than it is to-day, though the methods were crude and the motives thaumaturgic rather than surgical. Other osteologic material from prehistoric graves records crude attempts at restoration of injured bony tissue; all of the processes being in accord with the essentially thaumaturgic medicine of the tribes surviving in recent times.

Irrigation and Agriculture.—Researches in the arid regions of the United States by Cushing, Mindeleff, and others have shown that certain aborigines attained considerable skill in irrigation and introduced reservoirs and acequias of great size; these extensive systems have been traced several hundred miles southward into Mexico, and they appear to extend thence through Mexico and Central America, where conditions fit, to find their fullest development, in connection with elaborate roadways, in Peru. These works, together with other facts, indicate the development of agriculture on an extensive scale in the arid lands of America, and point out the way in which the products and method were diffused thence into more humid areas. Remains of corn, beans, squash, and tobacco have been found preserved in prehistoric graves or structures; and the petroglyphs and corrals indicate that the turkey and dog, and apparently the guanaco, were domesticated before the advent of the white man.

ARCHBISHOPS. See ROMAN CATHOLIC CHURCH and ENGLAND, CHURCH OF.

ARCTIC EXPLORATION. The interest in Arctic exploration in 1898 was the culmination of an enthusiasm for northern discovery that has constantly increased during the last ten or twelve years. In the latter part of 1897 and the early part of 1898, the interesting narrative of Herr Professor Fridtjof Nansen in *Farthest North*, and the appearance of the explorer himself on our lecture platform made familiar to the popular mind the story of the daring Norwegian's drift in the *Fram* through the Polar Sea north of Siberia, and his final advance by sledge to lat. 86° 14', the farthest point north hitherto reached, being only 260 miles from the Pole. The public interest aroused in 1897 in the Andrée balloon voyage continued in 1898. The following is a brief account of this novel venture.

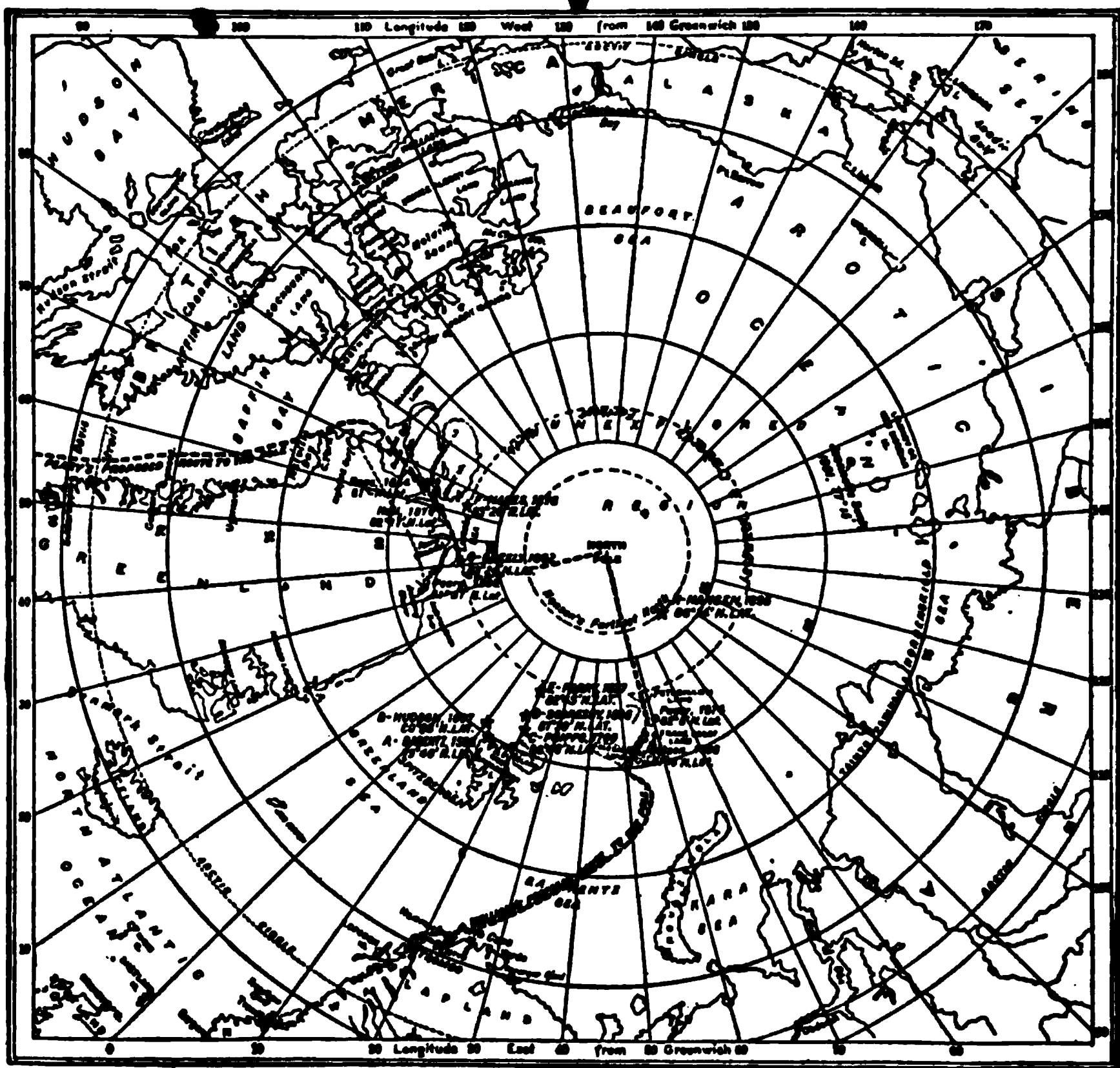
The Andrée Voyage.—In the summer of 1897 Herr S. A. Andrée, a Swede, made his famous attempt to reach the North Pole by balloon. Before 1890 Herr Andrée had conceived the idea of utilizing the air currents for purposes of transportation, and at that time experimented in ballooning. In both 1893 and 1894 he crossed the Baltic in a balloon, though in the latter year involuntarily. In February, 1895, he presented his matured plans to the Swedish Academy of Science, and in the following August he addressed the International Geographical Congress at London with such clearness and force that the scientists were convinced of the feasibility of his plan. In 1896 the voyage was attempted, but was given up on account of unfavorable winds; Andrée, however, erected on Dane's Island a balloon house, 85 feet high, which he found the following summer but slightly damaged. This voyage of 1897 was made possible by the generosity of some of his former patrons, including King Oscar II of Sweden. The balloon was enlarged slightly so that its dimensions were 22 by 23 metres and its capacity about 5,000 cubic metres. The party, having left Guthenburg, May 18, on the gunboat *Svenkrund*, the cargo-steamer *Virgo* accompanying them, sailed on the 26th from Tromsø, Norway, and came in three days to Dane's Island, which is near the 80th parallel. Although they encountered much difficulty from storms, by July 1 everything was ready for the balloon ascension, but it was not until the 11th that the wind was favorable. On this day with all his equipments, including scientific instruments and carrier pigeons, the daring Swede accompanied by his friends Dr. Strindberg and Herr Fraenkel, was wafted away before a strong southwest wind in the great balloon with its five tons burden.

On July 15, the whaler *Alken* took a carrier pigeon bearing the following message: "July 13th, 12:30 o'clock noon. Lat $82^{\circ} 2'$, long. $15^{\circ} 5'$ east. Good speed eastward, 10° to south. All well on board. This is the third pigeon-post.

"Andrée."

The authenticity of this message was vouched for by Mr. Jonas Stadling, who accompanied Andrée to Dane's Island, knew the kind of paper to be used, and was familiar with Andrée's handwriting. It is difficult to understand how such little progress was made in about 44 hours, for a strong wind was blowing. When we consider that thus two days of the precious fifteen or twenty that the balloon could remain afloat were used with little effect and that at the time of sending the message they were going in a direction a little south of east, it seems fair to conclude that the balloon never crossed the Pole, and that the practicality of Andrée's theory of the utilization of aerial currents for arctic transportation has not been demonstrated. A party sent in search of Andrée returned having found no traces of him.

Expeditions in 1898.—In 1898 five Arctic expeditions were undertaken. Mr. Frederick Jackson, an Englishman, having returned in the fall of 1897 from Franz



ADVANCE MADE TOWARD THE NORTH POLE DURING THREE CENTURIES, WITH PROPOSED ROUTES OF PEARY AND WELLMAN.

(By courtesy of the *Review of Reviews*.)

Josef Land, planned another northern voyage which he began in the summer of 1898. His route was along the western coast of Greenland and through Jones Sound, his intentions being to explore the unknown lands supposed to be to the north and west. Captain Otto Sverdrup, who was with Nansen, having secured the loan of the *Fram* and a subsidy from the Swedish government, sailed from Christiania, June 24. In the expedition were a number of European scientists who proposed to make observations along the coasts of Greenland and Grinnell Land. Although Captain Sverdrup intended to go north through Smith Sound, it was said that he did not expect to reach the Pole. Another Swedish expedition also went north under the com-



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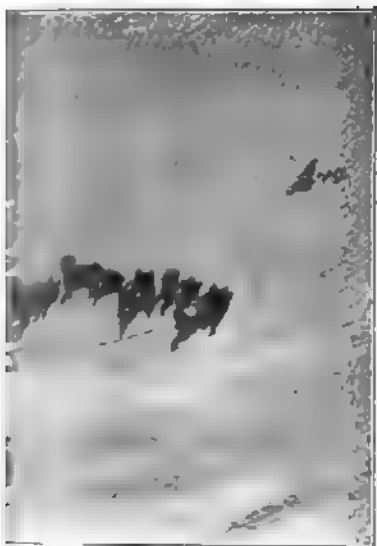
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ARCTIC EXPLORATION.—1. Mr. S. A. Andree. 2. The "Fram" leaving Norway. 3. 4. 5. 6. Mr. Walter Wellma.



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1. Nansen's "Ragnvald Jarl" crushed by ice. 4. Arctic sledging. 5. Dr. Fridtjof Nansen.
 6. 7. Andree's halloon.
 (By courtesy of *Review of Reviews*.)

mand of Dr. A. G. Nathorst, who accompanied Nordenskjöld in his Greenland expedition of 1883. The Arctic expedition of Mr. Walter Wellman sailed from Tromsø, Norway, June 26, in the ice-steamer *Fridtjof* with a crew of nine men. Mr. Wellman, who is an American from Ohio, has for years been interested in Arctic discovery, and in 1893 tried to reach the Pole, but his ship was crushed in the ice and he returned in 1894. The expedition of 1898 was a repetition of his former attempt, the base of supplies, however, being in Franz Josef Land instead of Spitzbergen. Mr. Wellman's chief purpose was to find the Pole, but he also hoped to see some trace of Andrée, while the scientists accompanying him, among whom were Professor Gore of the Columbian University, and Lieutenant Baldwin of the Weather Bureau, expected to make surveys and scientific investigations, especially in gravity and magnetism. The expedition, having taken supplies and Siberian draft dogs at Archangel, put about for Cape Flora, expecting to reach there between August 1 and 15. At this point a supply station was to be located. The scientists were to go no further north, but Mr. Wellman with five others, all of whom were probably Norwegian seal and walrus hunters, expected to go on, wintering near Cape Fligely, which is 550 statute miles from the Pole. In the spring of 1899 the dash for the Pole would be made.

The Peary Expedition.—It is likely that Lieutenant Robert C. Peary's expedition will prove to be the most important of the year. Lieutenant Peary's account of his Arctic explorations. *Northward Over the Great Ice*, was published in the spring of 1898. A *résumé* of these expeditions may enable one better to understand the plans and purposes of the great voyage of this year. His first Greenland expedition was made in 1886, while the most important hitherto are those of 1892 and 1895. From '93 to '95 he made a number of unimportant excursions with three or four persons beyond the ice-cap. His attempt in '95 to make a sledge journey across northern Greenland, though successful, was attended with great suffering and was so disastrous that Peary was two years in recovering from its effects. In 1896 he made a sixth voyage to Greenland for the purpose of bringing back the 100-ton meteorite at Cape York but on account of the ice he was unsuccessful.

The experience gained in these years of Arctic exploration led Lieut. Peary to introduce new and successful methods of procedure. The important features are—the utilization of the inland ice as the road, with but two or three in the party, the supplies being carried on sledges by quite a large number of Eskimo dogs. A large proportion of these dogs are gradually fed to the others. Lieut. Peary says that the maximum value of this plan would be, "that the two men would subsist during the last four or five days of their return march upon the flesh of their last dog, he previously having eaten all his comrades. This maximum value was nearly reached in my 1895 journey." In this journey of 1895, he exhausted the possibilities of his overland method in Greenland, having reached the northern land limits. On account of this he planned his great expedition of 1898 across the ice of the Polar Sea north of Greenland, still adhering to the methods already developed, with the exception of the inland-ice route, but ready to modify them as occasion might demand.

From the fact that Jackson and Nansen, returning from their expeditions, announced that Franz Josef Land was not an Arctic continent but rather a small archipelago, and from the fact that the *Fram* in drifting three years through the Siberian segment of the polar basin came in sight of no land to the northward, Lieut. Peary concluded that the Pole could be reached only in some other way. As the land north of the mainland of Greenland was the most northern known, he determined to make this his base, his route being through Smith Sound, Kane Basin, Robeson Channel, and along the northwestern coast of Greenland. He planned to force his way by ship to Sherard Osborn Fiord or farther, land his people and stores, and send the vessel back; by advancing northward as soon as the freezing of the ice would allow sledge travel, he expected to be at the northern terminus of the North Greenland Archipelago with his party and most of his supplies in the early spring of 1899. This is in latitude about 85° or 330 statute miles from the Pole. From this point the last stage of the journey would be made over the frozen sea with two Eskimos, picked dogs, and light equipment. Should the ice conditions, however, prove unfavorable, he would be prepared to wait a year or a number of years; while the ship would return each summer, or every other summer, with supplies. While waiting for favorable conditions, a detailed survey of the Archipelago could be made. The special points in favor of Lieut. Peary's plan are: The employment of native Eskimos, who have learned to know and love Peary and in whom he can trust; a fixed point of return, rather than Nansen's plan of a drifting ship, and stores at each prominent headland; the assurance of the possibility of retreat without help from the ship.

In the spring of 1897 Lieut. Peary secured a five years' leave of absence from the Navy Department, and in the summer made a preliminary voyage to confer with the tribe of Smith Sound Eskimos and have them prepare to help him in 1898. The

Hope sailed from Boston, July 19; Peary touched at Cape York and took aboard the great meteorite that he had failed to obtain the previous year. He brought it to New York. The Eskimos, selected for the colony at Sherard Fiord, showed much childish enthusiasm to undertake the expedition, and were all tried men personally known by Lieut. Peary. The fact that he determined to work as simply as possible, to follow in the main the customs of the Eskimos, to live in snow houses, and to make the last stage of his journey with "the smallest party with lightest equipment and the fewest necessities," leads one to await the result of this expedition with no small degree of expectancy and hope. Lieut. Peary has the endorsement of the Royal Geographical Society of London, the Royal Scottish Geographical Society of Edinburgh, and the American Geographical Society.

ARGENTINA, a republic on the Atlantic coast of southern South America, comprises fourteen provinces and nine territories, whose aggregate area is estimated at 1,778,195 square miles, and whose population according to the census of 1895 was 3,954,911. There are about 30,000 Indians. There has been a steady increase of the population since the year 1869 (4.6 per cent. per annum) and the statistics of immigration since 1892 would seem to show that the rate of increase is growing. In the consular report of January 1898, a letter from the minister of the United States to Argentine Republic, bearing date of September 22, 1897, gives some important data regarding the immigration into the Argentine Republic during 1896. The total was 164,218, of whom 75,204 were Italians, 18,051 Spaniards, 3,486 French, 1,039 Germans. The other nationalities in the order of their importance were Austrians, Turks, Swiss, Russians, English, Belgians, and Moors. The number of immigrants from other nations was in each case less than 200. In religion the great majority of the immigrants were Roman Catholics and in profession a great majority were agriculturists. The immigration since 1873 has fluctuated considerably. In the five year period 1873-77 the immigrants numbered 253,965. In the period from 1888 to 1892 they numbered 652,526. The foreign inhabitants of Argentina in 1895 numbered 1,004,527. The largest and most populous province is Buenos Ayres, which, exclusive of the city of the same name, has an area of 63,000 square miles and a population of 921,168. The province Jujuy is the least populous (49,712), averaging 1.8 a square mile. The largest and least populous district is the territory Santa Cruz, whose area is 182,500 square miles and whose population is placed at 1,058, or .005 a square mile. In 1897 the capital, Buenos Ayres, had a population of 726,917, of whom over 346,000 were foreigners. Other cities of importance, with populations for 1895, are Rosario, 94,025; Cordoba, 47,609; La Plata (which is the new capital of the province of Buenos Ayres and was founded in 1884), 45,410; Tucuman, 34,300; Mendoza, 28,709; Santa Fé, 24,755; Paraná, 24,261; Salta, 16,600; Corrientes, 16,129; San Juan, 10,410.

Government.—According to the constitution which was adopted in 1853 and modified in 1860, and which with a few exceptions is like that of the United States, the executive authority is vested in a President chosen for six years by an electoral college representing the fourteen provinces and having twice as many members as there are Senators and Deputies combined. He is commander-in-chief of the army. He is assisted by a ministry, appointed by himself, and which with himself is responsible to Congress, consisting of five departments, namely, the Interior, Finance, War, Foreign Affairs, Justice, and Agriculture. The President in 1898 was Don Julio A. Roca. The legislative authority devolves upon a Congress of two houses, a Senate and a House of Deputies. The members of the former number 30, two being elected by the legislature of each province, and two by special elections at the capital. The Deputies, elected by popular vote, are 86 in number. Deputies are chosen for four years and Senators for nine. The latter must have an annual income of 12,000 pesos. Congress meets each year from May 1 to September 30. The provinces elect their own legislators and governors and may contract loans on their own responsibility. Each State has its own judicial system, but the constitution provides for trial by jury in criminal cases. There are local and inferior courts, and a court of appeal, known as the Supreme Court, consisting of five judges and an attorney-general.

Finance.—The revenue and expenditure of Argentina have been as follows:

	1894.		1895.	
	Pesos Gold.	Pesos Paper.	Pesos Gold.	Pesos Paper.
Revenue	28,255,719	21,142,921	29,805,651	28,958,460
Expenditure	19,950,193	72,015,214	24,165,239	83,933,386

	1896.		1897 (estimated).	
	Pesos Gold.	Pesos Paper.	Pesos Gold.	Pesos Paper.
Revenue	32,052,951	29,468,174	.....	.....
Expenditure	46,891,221	92,122,343	19,957,402	83,335,168

	1898 (estimated).	
	Gold Pesos.	Paper Pesos.
Revenue	32,049,454	40,546,009
Expenditure	19,957,402	92,159,745

The principal sources of revenue are import and export duties, internal taxes, railways and public works, and stamps; while the heaviest item of expenditure is interest on the national debt. This debt at the beginning of 1897 was: External, about 316,000,000 pesos gold; internal, 91,861,000 pesos gold, and 82,374,994 pesos paper; total about 490,000,000 pesos. Each province and municipality has its own budget. The provincial debts in 1895 amounted, with arrears, to 137,261,866 pesos gold, and the municipal debts to 24,596,422 pesos gold. In 1895 a law was passed providing for the unification of the national debt and the provincial foreign debts.

In August, 1897, the paper currency amounted to 285,115,964 pesos. There are many private banks in Argentina and fourteen state banks. In 1891 a law was passed placing the old National Bank in liquidation, and the new bank of the Argentine nation, having a capital of 50,000,000 pesos, was opened in December of that year. The paper currency in August 1897, amounted to 285,115,964 pesos. The peso is valued at \$0.965 United States currency.

Army and Navy.—The standing army in time of peace is reported to consist of 945 officers and 12,073 men, while the number of the effective army, according to a statement before Congress in 1897, should be 29,513 officers and men. Efforts are made to drill at intervals the national guard, which numbers about 480,000. Besides a school for non-commissioned officers, there is a military school with 125 cadets.

Of the South American navies those of Brazil and Chile alone excel that of Argentina. It consists of 2 monitors, 2 first-class cruisers, 3 second-class cruisers, 3 armored cruisers, 11 smaller cruisers, gun-boats, etc., and 12 first-class and 10 second-class torpedo boats. The complement is placed at 1,530 officers and men. Among the more important vessels are: the armored cruiser *Almirante Brown*, built in 1880, displacement 4,200, nominal speed, 14 knots; the cruiser *Nueva de Julio*, built in England in 1892, displacement 3,575, nominal speed 22.5 knots; the second-class cruiser *Buenos Ayres*, displacement 4,500, trial speed 23.2 knots. The powerful armored cruisers *San Martin* and *Garibaldi* (displacement each 6,500) were bought of Italy. All of these vessels are well armed. The navy contains other vessels of remarkable excellence. There is a naval school with 60 cadets, and a school of gunners with 80.

Industries.—Agriculture and the raising of cattle are the chief industries of the country. The former, however, is in a backward condition, the area of tilled land in 1895 being about 15,000,000 acres, or 6.2 per cent. of the area available for cultivation. The efforts made to improve agriculture in recent years have not been attended with very great success. Wine was produced in 1895 to the amount of 42,267,200 gallons; raisins, 10,582 tons; alcohol, 478,800 gallons. The estimated sugar crop in 1897 was 110,000 tons. Wheat is a staple product, the yield for 1897 being 1,500,000 tons; in the same year maize and flax amounted to 400,000 tons. Cattle in 1895 numbered over 21,700,000 and sheep 74,380,000. These immense herds furnish large items of export. The census report of 1895 places the number of flour mills in the country at 532; distilleries, 108; wine factories, 852; breweries, 44; sugar plantations, 2,749; vineyards, 6,514; sugar mills, 48. A Jewish Colonization Association has acquired agricultural lands amounting to 318,000 acres in the provinces of Buenos Ayres, Entre Rios, and Santa Fé. The mineral resources of the country are not important, petroleum is obtained in Mendoza. The domestic demand for coal and oil is for the most part supplied from abroad. Coal, however, has been discovered in Terra del Fuego, and samples of it were tested in 1898 at Buenos Ayres with satisfactory results. As this coal, which was taken from the surface merely, was of such excellent quality, it was thought that the prospect was promising. A large and accessible supply of coal would stimulate manufacturing to a high degree. It was proposed to send down machinery and find out how much of the coal was available. Virginia coal has been sent to the Argentine Republic and has proved acceptable. Thus a trade has been started in this mineral and much is expected from it. An agency for United States coal has been opened at Buenos Ayres. In 1896 the value of the mineral produce exported from Argentina was placed at 352,840 pesos.

Commerce.—The following gives the value in pesos of exports and imports for 1894-96:

	1894	1895	1896
Exports	101,249,000	118,937,000	115,670,964
Imports	92,724,000	94,856,000	112,058,002

More than 86 per cent. of the imports in 1896 passed through Buenos Ayres. The principal exports in 1896 were valued in pesos as follows: Produce of the herds,

70,534,040; farm produce, 36,963,480; manufactured products, 6,169,105; forest produce, 1,268,663; mineral produce, 352,840. Among the chief imports for the same period were: textiles and clothing, 38,413,839 pesos; iron, railway material, etc., 17,753,662; foods, 14,172,747; coal, coke, oil, etc., 8,569,431.

In the autumn of 1898 statistics were issued showing the extent of the foreign trade for the first six months of that year as compared with the same period in 1897. The value of all the imports with the exception of bullion and specie was \$49,553,375, a decrease of \$150,404 as compared with the first six months of 1897. The exports, exclusive of bullion and specie, during the same period were valued at \$81,632,825, an increase over the first six months of 1897 of \$17,594,290, showing of course a large balance of trade in favor of the Republic. There was a considerable increase in the tariff rates in 1898. By a law passed on September 22 of that year the ad valorem duties of 5 per cent. and under were doubled, and those above 5 per cent. were subject to 10 per cent. additional and 10 per cent. on customs law.

The conditions of the wheat market in the Argentine Republic were unsettled during the spring of 1898. On the outbreak of the war between the United States and Spain a period of depression set in and in the summer of 1898 the wheat market was almost entirely paralyzed.

The steadily growing trade between the Argentine Republic and the United States is shown by the following table taken from the Consular Reports of June, 1898.

Year.	Exports from the United States to Argentina.	Imports into the United States from Argentina.
1892.....	\$2,927,488	\$5,343,798
1893.....	4,979,696	5,239,095
1894.....	4,862,746	3,497,030
1895.....	4,456,163	7,675,270
1896.....	5,979,046	9,313,385
1897.....	6,072,478	10,772,627

See the article SOUTH AMERICA.

Shipping and Communications.—The merchant marine in 1894 consisted of 75 steamers of 21,613 tons net, and 125 sailing vessels with a net tonnage of 28,241. In 1895 there entered 6,496 steamers and 9,878 sailing vessels, having an aggregate tonnage of 6,247,101; the number entering in 1896 was 7,791 steamers and 11,830 sailing vessels, whose aggregate tonnage was 7,115,467.

In 1896 the railway lines open for traffic amounted to 8,998 miles, the capital in gold pesos being in the same year, 510,643,296; the gross receipts, 31,238,326; the expenses, 15,934,466. Some of the lines are owned by the government. The total cost of construction of the lines open in 1894 was 483,508,766 pesos. The total length of telegraph lines in 1896 was 25,345 miles with 59,060 miles of wire and 1,237 offices. The same year the post and telegraph offices amounted to 1,460, and 177,183,190 letters and packages were carried in the mails. The receipts from the postal and telegraph service in 1895 were 30,069,799 pesos, and the expenditure 27,169,020 pesos.

The figures given above setting forth the development of the trade between the United States and Argentina, as well as figures showing an increase in trade with Brazil and Uruguay, have led to a proposal that a new steamship connection be established between the United States and these countries. In 1898 the lines of steamers plying between New York and Buenos Ayres were the Norton Line, the Prince Line, and the Lamport and Holt Company, all of which were British. It is thought that the proposed new American line would effect a saving of ten days in the time required for the voyage under the present conditions. The exports from the United States to Argentine Republic include sack cloth, cotton goods, binding twine, oils, furniture, books, kitchen utensils and various kinds of tools and machinery. From the Argentine Republic the United States receives a variety of animal products, together with flour, cabinet woods, guano, bones, etc. Almost the entire trade is carried on directly between New York and the Argentine ports. It was thought that trade conditions were such as to promise a high rate of profit to an investment of capital in this new steamship enterprise.

Religion and Education.—The State religion is Roman Catholic, but all other faiths are tolerated. For children from six to fourteen years of age, primary education is gratuitous, secular, and compulsory. These schools receive local, state, and federal support. In 1896 the number of primary schools was 2,681 public, 1,034 private, and 34 national, having a total of 8,557 teachers and 264,294 pupils. For secondary education the government maintains 16 lyceums, which have 450 professors and 2,629 students. There are three normal schools, having 1,770 students, and three universities at Buenos Ayres, Cordoba, and La Plata respectively; the universities have

faculties of law, medicine, and engineering, the total number of students being about 300. There are two colleges of agriculture. There are museums at Buenos Ayres and La Plata, and a national university both at the latter city and at Cordoba.

Events of 1898.—Congress opened on May 9, 1898. The President's message declared that the interest on the external debt had been regularly paid and that the internal debt had been considerably reduced. In June Gen. Roca was elected President and Dr. Quirino Costa Vice-President. An important measure in internal administration was the levying of new taxes upon hats, wines, alcohol and oils. The prolonged boundary dispute between Argentina and Chile reached a new stage in the course of the year. The dispute arose out of different interpretations placed upon the treaty of 1881, of which one of the articles declared the boundary line between the Argentine Republic and Chile from north to south as far as the 52d parallel, south latitude, to be the Andes mountains, the line to pass along the highest summits of these mountains and between the watersheds or slopes which lie on each side. It was further provided that, should disputes arise as to the course which the line should take, they were to be decided amicably by experts chosen by the two governments. The Argentines interpreted this article as meaning that the line must lie within the Andes while the Chileans held that it should be traced through the hills and plateaux of Patagonia across the headwaters of the streams that flowed westward. The conflict therefore arose from the fact that the terms of the treaty seemed to be inconsistent and inapplicable to the topographical features of the country, since a line passing between the watersheds would not, in some parts of the region, pass also along the summits of the highest mountains. To the Argentines it seemed essential that there should first be undertaken a survey in order to determine the position of the highest summits, while the Chileans held that the delimitation could be carried on at once, since it required no previous survey to determine the position of the water sheds. An attempt was made to determine the line in the spring of 1892, but the expert named by the Argentine government would not accept the result. In the following spring it was agreed that the survey should be revised. The Argentines declared that the line proposed by the Chileans fell far within Argentine territory. This was now disputed by the Chileans. Another agreement was concluded in the spring of 1896 and several sub-commissions have since been engaged in surveying the country. The portion of the line in dispute in 1898 was that which extended from the 57th parallel to the 40th of south latitude where the mountains branch out east and west; and in one place, if the line passed along their highest summits, the territory of Argentine would be carried as far as the Pacific. The Argentines did not insist upon this extreme interpretation, but at the same time refused to give up the wide tract of territory which would fall to Chile if the latter's understanding of the treaty were accepted. Early in the year Chile had another boundary dispute on her hands with Peru, but so soon as this was settled the Chilean government demanded a prompt adjustment of the dispute with Argentina. Two arbitrators were appointed and negotiations went on during September, when it was decided, upon the report of the arbitrators, to leave the definition of that portion of the boundary which was south of latitude 26°, 52', 45", to the decision of Queen Victoria, in conformity with the terms of the treaty of 1896, while the boundary line to the north of that should be determined in case of disagreement by a representative of the United States as umpire. Late in the autumn President McKinley authorized the American minister to Argentina to sit as the third member of a tribunal of arbitration. It was also agreed to establish a commission composed of five members from each country to report upon the disputed clause of the treaty.

It was reported in 1898 that a German subject had obtained a concession from the Argentine government for the building of a railway system estimated at some 2,000 miles in length. In 1898 the report of the second Princeton geological expedition to the unexplored portion of Patagonia was for the first time made public. This expedition added greatly to the knowledge of the region and brought back many valuable specimens of the fauna as well as interesting collections of arts and manufactures illustrating the degree of civilization attained by the natives of the interior.

ARID LANDS. See IRRIGATION.

ARIZONA, a southern Territory of the United States, with an area of 113,920 sq. m. Capital, Phoenix.

Agriculture.—In his message for the year ending June 30, 1898, Gov. Murphy shows that of the total area of the territory less than one-half per cent. is arable land, and of this part more than one-fourth of a million acres are under canal irrigation. With the cana¹ under construction this area will soon be greatly enlarged. He recommends that all the arid lands be ceded to the territory for local reclamation and occupation. During the year much attention was given to the cultivation of a number of crops new to Arizona, including sugar beets, the canaigre plant for tanning, date palms, melons, cotton, tobacco, and sugar cane. Grazing was par-

ticularly profitable during the year because of the profuse rains. The principal crops were: wheat, 770,532 bushels, value \$708,889, and hay, 116,487 tons, value \$1,397,844. The farm and ranch animals comprised 50,414 horses; 1,041 mules; 18,404 milch cows; 381,812 oxen and other cattle; 1,014,287 sheep; and 23,286 swine—total head, 1,489,244.

Mining.—The territorial geologist reports that of all the metals gold is now the most widely and generally distributed. The gold, silver, and lead mines were worked during the year with gratifying results. Copper showed a larger development than in former years. The production in 1897 was 81,019,922 pounds and in the first six months of 1898, 49,503,294 pounds. Rich veins of manganiferous wolframite have been found at Russellville in the Dragoon mountains; and other rare minerals, such as vanadinite and huebnerite are being worked. At Turquoise mountain, in Mohave county, ancient Aztec workings have been cleared and hundreds of pre-historic stone implements have been found. There are onyx beds of marvelous quality in Yavapai county and the garnets of the Navajo country are highly prized.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise into the districts of Arizona were valued at \$1,752,696, an increase of nearly \$1,000,000, and the exports were valued at \$1,188,301, an increase of \$160,810. The imports of gold and silver amounted in value to \$2,699,626, making the total trade of the year \$5,641,623.

Railways.—In 1898 there were 10 different railroads under operation within the territory, having an aggregate mileage of 1,366, of which the Santa Fé Pacific, with 393 miles, and the Southern Pacific of Arizona, with 383 miles, were the most important. Much new construction was under way, nearly all the roads made extensive improvements, and the general business was very satisfactory.

Banking.—On October 31, 1898, there were 5 national banks in operation, with capital, \$400,000; circulation, \$135,560; deposits, \$1,539,290; and reserve, \$620,240. The territorial banks on June 30, 1898, numbered 7, and had capital \$221,600; deposits, \$1,279,379; and resources \$1,578,907.

Education.—At the close of the school year ending June 30, 1898, there were 18,802 children of school age, of whom 14,613 were enrolled in the public schools. The school districts numbered 244; the teachers 365. The value of public school property was \$472,107, and the expenditures of the year, including \$169,894 for teachers' salaries, were \$221,389.

Finances.—In 1898 the assessed property valuations aggregated \$31,473,359, the largest items being land, railroad property, cattle, city and town lots, and improvements on such lots, and the total showing an increase in a year of \$859,647. The bonded and floating debt on July 1, 1898, was \$997,260; cash on hand \$123,861; net debt \$873,399. A movement was started early in the year to devise means of raising territorial revenues from mines and other industrial sources now untaxed.

Statehood.—The agitation for the admission of the territory into the Union was again temporarily checked by the rejection of the statehood bills of Arizona, New Mexico, and Oklahoma by the House Committee on Territories on January 26, 1898.

Population.—As estimated by Federal officials the population on June 30, 1898, was about 75,000. At the same date the government estimated it at 100,000. There are five Indian agencies in the territory, and Colorado river, Navajo, Hualapai, Prima, and San Carlos, and they contained approximately 40,500 Indians, all living more peaceably than ever before in their history.

History.—An important event was the convention held in Phoenix in January, 1898, consisting of the members of the boards of supervisors of the twelve counties of Arizona, the assessors, the territorial officials and the territorial board of equalization to devise means of raising revenues from mines and other sources. The total assessment of the territory is \$30,000,000, yet the United Verde mine at Jerome is rated worth that sum, and pays taxes in Yavapai county on about \$300,000. On Jan. 25, the Governor called a meeting of the miners of Arizona to form a miners' association. As Arizona has now a population of nearly 100,000 and the citizens are loyal and patriotic, Gov. Murphy recommended in his annual report to the Secretary of the Interior that Arizona should be admitted as a State; that all public lands within the territory be ceded to the territory or State; that the military post, "Whipple Barracks," be re-established; that a sum be apportioned for boring artesian wells; that a commission be appointed for ethnological and archaeological research in the territory, that the salaries of the Federal judges be increased, and also those of the territorial legislature. There was no outbreak of Indians: even the Apache tribes were quiet. The Arizonians were the first to respond to the call for volunteers in Cuba and distinguished themselves for bravery. The President by proclamation (May 10) set apart the Prescott Forest Reserve and prohibited settlement there.

National Representative and State Officers.—The newly elected Delegate to the House of Representatives is J. F. Wilson (Dem.), from Prescott. The Territorial Governor (1899) is N. O. Murphy; Secretary, Charles H. Akers; Treasurer, F. W.

Pemberton; Auditor, G. W. Vickers; Adjutant-General, R. A. Lewis, Attorney-General, C. A. Ainsworth; Superintendent of Education, A. P. Sherman, all of whom are Republicans; Chief Justice of the Supreme Court, Webster Street; Associates, Richard E. Sloan, Fletcher M. Doan, George R. Davis, and Clerk, L. Johnston. These jurists are Republicans. In the territorial legislature there were 22 Democrats and 14 Republicans.

ARKANSAS, a south central State of the United States with a land area of 53,045 sq. m. Capital, Little Rock.

Agriculture.—Official reports for the calendar year 1898 showed a notable increase in the yield of several of the cereals, especially corn, wheat, and oats. The principal crops and values were: corn, 45,365,220 bushels, \$13,155,914; wheat, 2,335,036, \$1,354,321; oats, 7,229,629, \$2,096,592; potatoes, 1,964,922, \$1,080,707; hay, 215,980 tons, \$1,457,865; and rye, 24,077, \$15,650—total value, \$19,161,049. The cotton crop of 1897-8 was 942,267 bales, value, \$27,293,141. The farm animals, Jan. 1, 1899, comprised 234,596 horses; 145,504 mules; 196,808 milch cows; 250,528 oxen and other cattle; 119,733 sheep; and 1,280,120 swine—total head, 2,227,289.

Banking.—On October 31, 1898 there were seven national banks in operation and seven in liquidation. The active capital aggregated \$1,070,000; circulation, \$252,324; deposits \$2,099,492; and reserve \$549,051. The State banks on June 30, 1898, numbered 37, and had capital \$1,502,524; deposits \$3,540,852; and resources \$5,860,326.

Education.—At the close of the school-year 1896-7 there were 460,200 children of school age in the State, of whom 316,270 were enrolled in the public schools, and 195,509 were in daily attendance. The percentage of enrollment by races was, white, 61.75; colored 62.02. There were 5,617 white teachers and 1,564 colored. Public school property exceeded \$1,845,375 in value, and the total expenditures, excluding payments of bonds, were \$1,276,934, of which \$1,090,511 were for teachers' salaries. The public high schools numbered 43, and had 106 teachers and 2,480 pupils, and the private secondary schools 27, with 64 teachers and 1,001 pupils. There were two public and six private normal schools, with a total of 546 students. For higher education there were nine colleges and universities, co-educational and for men only, with 93 professors and instructors and 1,618 students; a college for women exclusively, with nine instructors and 85 students; and a law school, with seven instructors and 37 students. The Arkansas Industrial University at Fayetteville, endowed by Congress, received from the Federal treasury \$22,000 in 1897, and \$23,000 in 1898. In 1898 there were 263 periodicals, of which 25 were dailies, 219 weeklies, and 14 monthlies.

Financial.—The assessed property valuations reached their highest known aggregate since 1860 in 1897, although an estimated valuation in 1890 was the highest on record. The 1897 values were: Real estate, \$117,873,253; personal property, \$59,552,873—total, \$177,426,126; and the State tax rate was \$4.75 per \$1,000. The total recognized debt on October 1, 1896, represented by bonds and overdue interest, amounted to \$4,218,752. The statement for the biennial period ending October 1, 1898 was not available at the time of writing.

Federal Debt Settlement.—The long-disputed debt between the United States and the State was settled in May, 1898. All the bonds and overdue coupons of the State held by the Federal government, excepting 160 that are to be paid in 1900, were turned over to the State and canceled. They amounted at their face value to \$1,476,120, and for them the State paid \$34,172. The amount still due the Federal government is \$160,000. In order to arrange this settlement the State had to surrender its claim to 273,000 acres of land which had been patented by the United States to land grant railroads. Ex-Governor Clarke and Governor Jones objected to this, but Congress insisted; and now Arkansas no longer rests under the stigma of refusing to pay her debts.

Population.—As estimated by Federal officials the population on June 30, 1898, was about 1,390,000.

History.—Arkansas elected a Democratic Governor in Daniel W. Jones. His plurality was 47,838. The Democrats also elected their candidates for Congress by substantial majorities. Their convention declared itself opposed to the issuance of interest-bearing bonds for the purpose of defraying the expenses of the war. The State legislature is Democratic with the exception of two Republicans in the House. The election was the least interesting in many ways since the time of reconstruction. In many places the vote was very light. In Little Rock less than a thousand went to the polls. Early in the year the Interstatehood Partisan Convention in session at Kingfisher adopted resolutions petitioning Congress to pass an enabling act providing for the admission of Oklahoma as a State. Dennis Flynn (Rep.), from Guthrie, was chosen to represent Oklahoma in the House of Representatives. On March 8, 1898, Congress permitted Arkansas to devote the proceeds arising from the sale of section numbered sixteen in every township to common school purposes.

National Representatives and State Officers.—The Representatives from Arkansas are all Democrats: Philip D. McCulloch, John S. Little, Thomas C. McRae, William L. Terry, Hugh A. Dinsmore, and S. Brundige, Jr. The Senators are James H. Berry, from Bentonville, and James K. Jones, from Washington, both Democrats. The officers of the State are: Daniel W. Jones, Governor; Alex. C. Hull, Secretary; Thomas E. Little, Treasurer; Clay Sloan, Auditor; Jefferson Davis, Attorney-General; J. J. Doyne, Superintendent of Education; Frank Hill, Commissioner of Agriculture; and J. W. Colquitt, Land Commissioner. Chief Justice of the Supreme Court, Henry G. Bunn; Associates, Simon P. Hughes, C. D. Wood, B. B. Battle, and James E. Riddick; and Clerk, P. D. English. In the State legislature there are 130 Democrats and 2 Republicans.

ARMENIA. Armenia and Kurdistan form a part of the Turkish empire. Armenia comprises the three vilayets of Erzerum, Diabekr, and Mamouret ul Aziz, together with the districts of Van and Bitlis, with a total area of 72,491 square miles, and an estimated population of 2,472,400. The estimates, however, are various and the figures showing the area and population can not be relied upon. Some place the area as high as 90,000 square miles and the population as high as 5,000,000. In latter years large numbers of the Armenians have emigrated owing to the massacres and have scattered themselves throughout the cities of Russia and in still more distant countries. For an account of recent aspects of the Armenian question see the article TURKEY.

ARMENIANS. There are 8,436 Armenians scattered throughout the United States. They consist chiefly of single men, who have fled to this country to escape from the Turkish rule, to earn their living. Many of them are employed in the silk-mills of New Jersey; hundreds are merchants, weavers, and repairers of oriental rugs; others are small shop-keepers, those in New England are laborers, and those in California and Texas engage in agriculture. There are also a number of lawyers, ministers, and doctors (fifteen Armenian physicians practise in New York City). Worcester, Mass., is their centre: other communities exist in Fresno, Cal., and Paterson, Texas. There are 1500 in New York City; 500 in West Hoboken; 800 in Worcester; 300 in Chicago and vicinity, and 400 in Fresno, Cal. There are two sects: the Gregorians, members of the old Armenian church; and Evangelicals, those connected with the Protestant communities of Turkey. The Gregorians hold services in New York, Worcester, Providence, and Cambridge, with the Right Rev. J. Larajian as their bishop and general pastor. They have about ten libraries and free lecture societies for the education of their young men, and in 1898 they collected \$8,500 for religious and charitable work. The Evangelicals have a church in Worcester, with 25 members, and also hold services in about twelve other cities.

ARMIES. See the articles on the separate countries.

ARMY AND NAVY UNION, organized in Cincinnati, in 1888, has now 170 garrisons with an estimated membership of 12,000, consisting of men who have served in the army, navy, and marine corps of the U. S. and received honorable discharges. The branches are called garrisons and are situated at military posts, on board war-ships, or at naval barracks. A circular issued since the Spanish-American War invites all honorably discharged men from any branch of the regular service, and all who took part in the campaigns against Spain, on land or sea, to join this Union for the following purposes: "To provide for our comrades and shipmates when sick or in distress, to bury our dead and extend a helping hand to the dependents of our departed, and to secure from Congress and other legislative bodies the enactment of laws beneficial to our comrades and shipmates." National commander, Henry Shindler, Leavenworth, Kansas.

ART. See MUSIC, PAINTING, SCULPTURE and ARCHÆOLOGY.

ARTESIAN WATERS. The several important artesian basins of the western States have for some time been under investigation by the United States Geological Survey, and during the year 1898 this work has been continued especially in Nebraska, and North and South Dakota. The points considered are, detailed information as to the location of water-bearing beds, extent of basin, and limits of territory in which artesian flow may be expected, and the prospects for a continued water supply.

In southeastern Nebraska, agriculture is not entirely dependent upon irrigation, but is greatly benefited by it. This region lies on the eastern slope of the great plains, and the underground waters, which are available, occur in several different horizons, one series of water-bearing sands occurring under the lowest and over the Pierre Shales. The other series of water-bearing beds are in the Dakota sandstone, but most of the wells occur in the former. In South Dakota the South Dakota sandstone carries a large volume of excellent water under high pressure, which is available over a wide area, in the eastern part of the State, and into depressions of the val-

ley of the Missouri river, and confluent valleys. The head is along the foot hills of the Black Hills and the Rocky Mountains, the pressure and head diminishing to the southeast, and in the extreme corner of the State there is no flow. The same conditions occur in northeastern Nebraska, and probably in central Nebraska, especially on the lower plains.

A curious increase of underground temperature at the depth of the wells mostly from 500 to 1500 ft. is shown by the temperature of their water. Thus the downward increase of heat at Fort Randalo is one degree F. for each 17½ ft., and the whole artesian district has a range from about 20 to 45 ft. for each degree in contrast with an average elsewhere of about 50 ft. for a degree. The causes of this exceptional condition in a region so far from any recent volcanic action and undisturbed by organic processes are not yet ascertained. See IRRIGATION.

ART STUDENTS' LEAGUE, established in 1875 by the art students of New York for the purpose of giving academic instruction in drawing, painting, modelling, and composition. The board of control consists of twelve members. President, Edwin C. Taylor, Corresponding Secretary, Alma de Mier. Prizes and scholarships are offered.

ASBESTOS. The production of this mineral in 1898, was 18,000 tons. No new mines were opened, and the American output came entirely from Georgia.

ASIA, FLORA OF. See BOTANY (paragraph Systematic Botany—Asia).

ASIATIC ASSOCIATION, formed in New York, June 16, 1898, to foster and safeguard the trade and commercial interests of the citizens of the United States and others associated therewith in the empires of China, Japan, and Corea, and elsewhere in Asia or Oceanica. President, Everett Frazer; Vice-President, Samuel Brewster; Secretary, John Foord (P. O. Box 1500, New York). Membership 130.

ASIATIC SOCIETY OF BENGAL, founded in 1784, consists of ordinary, associate, corresponding and honorary members. The society owns a fine Museum and has a library rich with valuable MSS. It publishes the series *Bibliotheca Indica*.

ASPHALT. See PAVEMENTS, PIPE LINES AND RESERVOIRS.

ASPHALTUM. This term includes the nearly liquid form known as maltha or brea, bituminous limestone and sandstones, and hard asphaltum which is known under various names such as albertite, elaterite, gilsonite, wurtzelite, lithocarbon, etc.

The production since 1890 has been:

Year.	Short tons.	Value.
1890.....	40,841	\$190,416
1891.....	45,054	242,264
1892.....	87,680	445,375
1893.....	47,779	372,232
1894.....	60,570	353,400
1895.....	68,163	348,281
1896.....	80,503	577,563
1897.....	75,945	664,632

California supplies both the liquid and hard asphaltum; Kentucky the bituminous sandstone; Indian Territory, bituminous limestone and sandstone; and Colorado and Utah, hard asphaltum known as gilsonite or uintahite. The imports of asphaltum in 1897 were 115,528 long tons valued at \$392,770 and came chiefly from Trinidad, but in lesser amounts from Mexico, Cuba and Europe.

ASSEMBLY, GENERAL. The officers elected at the last General Assembly of the Presbyterian Church in America were: Rev. Wallace Radcliffe, Washington, D. C., Moderator, and W. H. Roberts, Stated Clerk. President, George Tuakin, Philadelphia; Treasurer, F. K. Hipple, Philadelphia; and Cor. Secretary, Rev. Joseph Beggs, Schuylkill, Pa.

The officers elected at the last General Assembly of the Presbyterian Church in the U. S. (South) were: Rev. E. M. Green, Danville, Ky., Moderator; Rev. W. A. Alexander, Stated Clerk; and Robert P. Farris, St. Louis, Permanent Clerk. President, E. N. Hutchinson, Charlotte, N. C.; Vice-President, T. B. Shearer, Davidson, N. C.; Secretary and Treasurer, John E. Oates, Charlotte, N. C.

ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, AMERICAN, organized in 1840, has 1,812 members. President, Wolcott Gibbs, Newport; Secretary, F. W. Putnam, Cambridge, Mass.; Treasurer, R. S. Woodward, New York. See ZOOLOGICAL SOCIETIES (paragraph American Association), and BOTANY (paragraph Botanical Societies).

ASSOCIATION FOR THE STUDY AND CURE OF INEBRIATES, AMERICAN, organized in 1870. Membership consists of superintendents and physicians of

inebriate asylums and others interested in studying inebriety as a disease. Last annual meeting was held in New York City, October 20, 1898. President, L. D. Mason, M. D., Brooklyn, N. Y.; Secretary, T. D. Crothers, M. D., Hartford, Conn.

ASSOCIATION OF AMERICAN ANATOMISTS, organized September 17, 1888; meets annually in December. President, B. G. Wilder, M. D., Ithaca, N. Y.; Secretary, D. S. Lamb, M. D., 800 10th st., N. W., Washington, D. C.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES, organized at Nashville, Tenn., May 21, 1890, for the full consideration of medical education in this country and measures for its improvement. Next annual meeting at Columbus, O., in June, 1899. President, H. O. Walker, M. D.; Secretary, Bayard Holmes, M. D., 103 State st., Chicago, Ill.

ASSOCIATION OF AMERICAN PHYSICIANS, organized in Washington, D. C., in 1886, for the advancement of scientific and practical medicine. Next annual meeting in Washington, D. C., in May 1899. President, G. Baumgarten, M. D., St. Louis, Mo.; Secretary, Henry Hun, M. D., 149 Washington ave., Albany, N. Y.

ASSOCIATION OF ASSISTANT PHYSICIANS OF HOSPITALS FOR THE INSANE, organized in 1895. Last annual meeting at Mendota, Wis., in October 1898. President, Geo. A. Post, M. D.; Secretary, Irwin H. Heff, M. D., Pontiac, Mich.

ASSOCIATION OF GENITO-URINARY SURGEONS, AMERICAN, organized in New York, October 16, to promote the study of genito-urinary and venereal diseases. The next annual meeting at Niagara Falls, N. Y., May 1899. President, James Bell, M. D., Montreal, P. Q.; Secretary, Wm. K. Otis, M. D., 5 W. 50th st., New York City.

ASSOCIATION OF LIFE INSURANCE MEDICAL DIRECTORS OF AMERICA, organized May, 1889, with the object of promoting medical science as applied to life insurance. Last annual meeting at Montreal, P. Q., Canada. President, H. C. Tabb, M. D., Richmond, Va.; Secretary, O. H. Rogers, M. D., 346 Broadway, New York City.

ASSOCIATION OF MEDICAL OFFICERS OF AMERICAN INSTITUTIONS FOR IDIOTIC AND FEEBLE-MINDED PERSONS, publishes an official organ, the *Journal of Psycho-Asthenics*, at Faribault, Minn. President, Mary A. Dunlap, M. D., Vineland, N. J.; Secretary, A. C. Rogers, M. D., Faribault, Minn.

ASSOCIATION OF MILITARY SURGEONS OF THE U. S., organized in 1891. President, J. D. Griffith, M. D., Kansas City, Mo.; Secretary, James E. Pilcher, M. D., Major U. S. A.

ASSOCIATION OF OBSTETRICIANS AND GYNÆCOLOGISTS, AMERICAN, organized in 1888, for the promotion of knowledge of abdominal surgery, obstetrics, and gynæcology. Next annual meeting at Indianapolis, Ind., the time being left to the executive council. President, Edward J. Ill, M. D.; Secretary, Wm. W. Potter, M. D., Buffalo, N. Y.

ASSOCIATION OF PHYSICIANS AND SURGEONS, AMERICAN, organized at Indianapolis, Ind., in October, 1894. Delegates are appointed by State societies of any school of medicine. Any physician may become a member. President, Wm. D. Gentry, M. D., Chicago, Ill.; Secretary, R. C. Kelsey, M. D., 211 Ohio st., Indianapolis, Ind.

ASTERIODS. See ASTRONOMICAL PROGRESS.

ASTOR LIBRARY. See NEW YORK PUBLIC LIBRARY.

ASTRONOMICAL PROGRESS DURING THE YEAR 1898. In the following pages we have given a very brief account of the advances made in the more important departments of astronomy. Technical details have been avoided as much as possible, but references have been added that will enable the reader who may desire more complete information to follow out the details of the various investigations.

The *Solar Parallax* has been the subject of very extensive researches during recent years, and these have been almost completely published in 1898. It is unnecessary here to refer to the scientific importance of an extremely precise determination of this quantity, beyond reminding the reader that measuring the solar parallax is really only another term for measuring the distance from the earth to the sun. This is the fundamental unit of distances in astronomy. Upon it depend directly all our notions as to the magnitude or extension of the solar system, and indeed of the universe in general. But the solar parallax problem is not only the most important one in fundamental astronomy: it is also perhaps the one offering the greatest difficulty in solution. Astronomical instruments enable us to submit to actual measurement only the directions in space of the heavenly bodies, never their distances. These latter must be obtained by computation from measured directions or angles, and for this purpose some base-line is indispensable. The largest possible terrestrial

base-line is of course a complete diameter of the earth. Yet so small is even this compared with the distance of the sun, that it would subtend an angle of only about eighteen seconds of arc to an imaginary observer at the sun's centre. When we reflect that an angle of one second corresponds to only three-tenths of an inch at a distance of one mile, we get some idea of the extreme minuteness of the earth's diameter as seen from the sun.

It is never possible, of course, to get a complete diameter of the earth for a base-line; but extraordinary efforts have been made to come as near as possible to satisfying this ideal condition. For many years observations of transits of Venus were considered the most favorable means of measuring the small angular differences of direction of the sun's centre as seen from opposite sides of the earth. No expense was spared, especially for the transits of 1874 and 1882, to secure very complete observations. Yet although the various civilized governments of the world sent out numerous and most elaborately equipped observing expeditions, the whole operation turned out practically a failure. It was simply impossible by this method to secure observations of the requisite precision. Of late years, two other methods have been pretty generally agreed upon as the best. The first is based upon the so-called constant of the aberration of light. It is known that the directions in which we see the stars are apparently thrown forwards towards that point on the sky to which the orbital motion of the earth is carrying the observer. It is a phenomenon analogous to the well-known fact that if a man be running in a rain-storm the falling-drops *seem* to slant towards him though they may really be falling vertically. So their direction seems to be thrown forward in the direction of the observer's motion. In the case of the earth's orbital motion around the sun, the observer will be moving in opposite directions in space at intervals of half a year. Consequently the effect of aberration is reversed, and the so-called "constant" or amount of aberration admits of determination from the differences of observations made six months apart. Without entering into technical details, it will suffice here to say that the solar parallax can be computed from the aberration constant, provided only that we know the velocity in miles per second of the transmission of light in space. This is fortunately known with quite sufficient precision from the recent researches of Newcomb and Michelson.

The other accredited method of determining the parallax is by observations of the planetoids. The method is extremely simple in practice, and also very accurate. It is necessary merely to await a time when one of these little bodies is favorably situated for observation, and then to fix its position telescopically with respect to the neighboring small stars. Let this be done simultaneously at two observatories situated very far apart on the earth, and using, of course, the identical small stars in both places. Then it is clear that the position determined for the planet will not be quite the same at the two observatories. It is like fixing the position of a distant point in an ordinary survey, only that here the base-line is the entire length of the straight line joining the two observatories. As a result we obtain directly the distance of the planet from the earth, in terms of this base-line as a unit. But this is known in miles from existing geodetic surveys of the earth. Thus we arrive at a knowledge, in miles, of the planet's distance. But from the ordinary processes of astronomical observation, we know the so-called elements of the planetoid's orbit. We can find from these by a simple computation based on Kepler's laws, the distance of the planetoid from the earth in terms of the latter's distance from the sun. Knowing then the distance between the earth and planetoid in miles from the special parallax observations, and in terms of the distance "earth-sun" from theory, we can at once deduce the value of "earth-sun" in miles. This, combined with our knowledge from geodesy of the terrestrial radius in miles, enables us to compute the angle subtended by that radius to an observer in the sun,—in other words, the solar parallax.

Now these two very precise methods of determining the parallax are of peculiar interest in the present year, because, as we have already said, the result of elaborate practical applications of both methods have just been published. The planetoid method has been put in operation by no less than twenty-five observatories, acting in coöperation. By thus increasing the number of observation stations the precision of the final result cannot fail to be greatly enhanced. The entire "campaign" was planned and managed by Dr. David Gill, of the Cape of Good Hope observatory. The observatories taking a principal part in the work, in addition to that at the Cape of Good Hope, were those at Bamberg, Leipzig, Göttingen, and, in this country, Yale University, at New Haven. All these observatories are provided with the modern heliometer, the most precise apparatus for measurement on the sky at present known to science. These instruments were all constructed by Repsold, of Hamburg, to whose skill as a mechanic the success of the whole undertaking is largely due.

The parallax determinations through the constant of aberration have been made principally in connection with the study of latitude variation, to which we shall

have occasion to refer again below. But it will be of interest here to show the relative importance or "weight," of the various parallax methods. The latest general work of high authority on the *Fundamental Constants of Astronomy* is by Simon Newcomb, and was published at Washington as recently as 1895. Professor Newcomb assigned the following "weights," or relative degrees of precision:

From the aberration constant.....	weight 68
From the planetoid method.....	weight 20
Six other methods combined.....	weight 35

Newcomb was already at that time in possession of preliminary results of Gill's researches, communicated to him in advance of publication. But since his writing, several important series of aberration determinations have been made public, and the results exhibit certain small discordances among themselves, which will probably tend to discredit somewhat the aberration method, and consequently to enhance the relative weight of the planetoid method. We shall see further on also that the latter method will probably gain greatly from the discovery, quite recently, of a new planetoid, much more favorably situated for parallax determinations than any previously known.

The final result for the solar parallax at present accepted by astronomers in general is 8".80, corresponding to a distance of 92,789,000 miles between the earth and the sun.

Measurement of the Apparent Shape of the Sky.—Among the minor, but interesting, researches of the year is one by Deichmüller of Bonn, having for its rather remarkable object the direct measurement of the apparent vault of the heavens. If this be found to differ at all from a hollow half-sphere, it must be the result of some form of optical illusion. Now it has long been known that the moon appears much larger when near the horizon than it does high up in the sky. This must of course be due to an analogous optical illusion. The common explanation is that when the moon is low down in the sky, the observer has a better opportunity to compare it with surrounding trees, houses, or other terrestrial objects. This explanation is, however, quite insufficient. Deichmüller tried the following plan with great success. A terrestrial point easily visible at night was selected, such as a light in the top of a steeple. The observer then simply placed himself in such a position on the ground that some bright star seemed to him to be vertically over the steeple. This could be accomplished easily by walking towards or away from the steeple. The star would then seem to travel along also in the direction of the steeple or away from it, and would finally seem to be just over it. The exact time was then noted, and the distance of the observer from the foot of the steeple measured. A simple calculation from the time of the observation gave the angular altitude above the horizon of the star at the instant of observation. Using the distance to the steeple as the base of a right-angled triangle, and the angular altitude of the star as the base angle, it was easy to compute the long side trigonometrically. This would then be the apparent distance of the star in linear measure. And since the star is set at a certain point on the vault of the sky apparently, we have also the distance of one point of that vault. Thus a series of apparent *radii* of the sky were obtained, corresponding to all sorts of angular altitudes. The results were surprisingly accordant among themselves, showing the method of observation to be capable of considerable precision. They brought out the interesting fact that the apparent shape of the sky is not spherical, but that it is considerably flattened at the top. In other words, the sky *seems* much further away from us near the horizon than in the zenith directly overhead. And this is the reason why the moon appears big in the horizon. For with a constant angular magnitude, it would of course appear biggest when projected on the "most distant" part of the sky.

This investigation of Deichmüller's is important for other reasons in addition to the great interest that attaches to the study of all forms of optical illusion. It is evident that quite a series of celestial observations will be influenced by any difference that may exist in our estimation of size and form in different parts of the sky. Thus an effect would be seen in observations of meteor paths, shape of comet's tails, aurora observations, and especially observations of the zodiacal light.

Astro-photography.—In no department of astronomy has development in recent years been so marked as in the application of photographic processes of observation. Indeed, it is not too much to say that they are beginning more and more to enter into very active competition with direct eye observing. Now the use of photography can be considered from two points of view. Of course it was to be expected that the sensitive plate would be tried in the telescope just as soon as photography itself became a matter of common knowledge among scientific men. So the use of the plate for the simple pictorial purposes of so-called descriptive astronomy could not fail to become very general. In short, the photograph is admirably adapted for find-

ing out what the heavenly bodies look like, and to fix their outlines, form, etc. But that the plate should also come to occupy a most prominent position in the astronomy of precise measurement was indeed not to be expected, or at all events, not immediately. And, if photography had accomplished nothing more than what it has done for descriptive astronomy, we should nevertheless rank it among the most powerful weapons in the armory of the astronomer. It is but necessary, for instance, to examine a series of eye and hand drawings of some total solar eclipse, executed by different skilled observers at the same time, to come at once to the conclusion that it is well-nigh impossible to obtain correct information in this way. The very outlines of the corona and prominences will sometimes differ so greatly that one would hardly believe an attempt had been made to delineate the same object. So fallible are the senses and the powers of execution of even the most highly trained observers. But let the photographic plate be submitted for the eye and hand of man. All is then changed. We obtain a faithful picture, drawn by Nature's own pencil, something exact to leave to future generations of investigators, who will perhaps succeed in solving some of the problems for which we now lack the essential observational material.

But it is to photography in exact astronomy that we would direct particular attention. It has been mentioned already, under *Solar Parallax*, that the heliometer, as we call it, is the most exact instrument we know of for executing measurements on the sky. Yet we must qualify that statement here, for the photographic plate, combined with subsequent measurement under the compound microscope, is beginning to claim very nearly an equal place. No one can say which will stand first a generation hence. It is difficult to fix the date when photography may be said to have first asserted itself in exact astronomy. But perhaps the year 1892 saw the first publication of an extensive series of photographic results of the highest precision. These were derived from excellent photographs of the cluster *Pleiades*, made in 1872 and 1873 by Rutherford in New York. Scheiner, of Berlin, calls this publication of 1892 the first in which the equality of the photographic results with those of the heliometer may be said to have been conclusively demonstrated. It has been followed in the last few years by numerous other series of star-cluster measures, so that we may say an extensive mass of material is being gathered by photography, material of the highest precision, and of the last importance in stellar astronomy. For it is only by a study of the minute inter-stellar motions in the star-clusters that we may hope, within the limits of human time, to throw some light upon the problems of motion within the greater universe that lies beyond our own solar system. Such are in truth the vast cosmic problems that expand and ennoble men's minds,—such the problems that have won for astronomy her title, "queen of the sciences." It is to photography that we must look for our observational material. For while the heliometer can doubtless give us equal or superior precision, it involves so much more labor in actual use as to render hopeless the possibility of doing more with it than merely touching the surface of the problem. Science demands generalizations, and these can be secured only by the discussion of very large masses of observations.

Stellar Parallax by Photography.—The study of stellar parallax has likewise received a quickening impulse from the introduction of photographic processes. We have explained under *Solar Parallax* that our distance from a heavenly body can be measured by using as a base-line the distance between two widely separated observatories on the earth. Of course the stellar distances are so excessively great as compared with distances upon the earth, that this same method cannot be utilized. The entire terrestrial diameter shrinks into absolute insignificance when compared with the space dividing us from our very nearest neighbor among the fixed stars. But we can fortunately in this case have recourse to a larger base-line. We can make use of the diameter of the earth's orbit around the sun. In other words, we can observe the slight displacement in direction of a fixed star when observed at intervals of half a year from opposite sides of the earth's orbit. Very few stars have been found near enough to us to exhibit a measurable displacement, even with so large a base-line as the one mentioned. But there can be no doubt that the enlarged observational facilities afforded by photography will before many years add not a few to the small list of known stellar parallaxes.

Meridian Photography.—Even the ordinary meridian instrument may have to yield to the sensitive plate. The so-called Transit Instrument is used for noting the instant of a star's passage (or "transit") across the meridian of the observatory. An attempt has been made to substitute photography for the eye in the use of such instruments. The only difficulty encountered seems to be a lack of sufficiently sensitive plates, so that observation has been perforce limited to stars of quite considerable brilliancy. But measures are now being taken to meet this trouble, and we may hope to announce complete success in transit photography in an approaching edition of this work.

We shall here only call attention in passing to the immense advances made in the

discovery of planetoids since the introduction of photography. The reader is referred to the paragraph Planetoids in the present article for a brief account of these amazing discoveries culminating in the interesting planet D Q, now known to be our nearest permanent neighbor in space, with the single exception of our moon.

A number of comets have also been discovered by photography, and reference is made to some of them under the heading of Comets, in a succeeding paragraph. It has been found that the photographic methods not only permit the discovery of these objects, but also furnish a means of determining their positions and orbits with greater facility and precision than could be attained by the older methods.

The Cape Photographic Durchmusterung, and the Astro-photographic Catalogue of the Heavens.—Decidedly the most complete triumph of photography in astronomy has been accomplished by the partial publication this year of Gill and Kapteyn's Cape of Good Hope Photographic Durchmusterung. The following is a brief account of this great undertaking. In the year 1882 a very bright comet appeared in the sky, and was especially conspicuous in the southern hemisphere. It was so bright that the idea occurred to Gill at the Cape of Good Hope observatory that it might actually be possible to photograph it. Having no special photographic apparatus, he called to his aid a neighboring portrait photographer named Allis. An ordinary portrait camera was employed by them, and for convenience in mounting it was simply strapped to the tube of an ordinary visual telescope in the observatory. With this apparatus they obtained what is believed to be in all probability the earliest successful comet photograph. In examining the resulting negative, Gill's attention was especially attracted to the extraordinarily large number of stars appearing on the plate as minute points or dots. Of course stellar photographs had been made successfully long before that time by Rutherford and others, but it was from the comet photograph of 1882 that Gill first got the inspiration that has led to an enterprise destined to figure as the crowning work of the nineteenth century in astronomical science. This is the astro-photographic catalogue and chart of the heavens, which, however, only came to be undertaken after the *Durchmusterung* was well under way. This term is German, but it has been naturalized in scientific English. It was first used to describe Argelander's great catalogue of stars in the northern half of the sky. Argelander conceived the idea that it would be very desirable to have an enumeration or census of *all* the stars in the sky, down to a given magnitude. His plan was to make it complete as to numbers, even if it should be impossible to give more than a rough approximation to the positions of the stars on the sky. Time has abundantly proved the correctness of Argelander's ideas. Other star-catalogues have arrived at high precision, but have been limited necessarily to a comparatively small number of stars. Human powers of endurance are insufficient to apply the more delicate processes of very exact observation to numbers of stars running into the hundreds of thousands. Exact catalogues have their uses; and are indeed the most important of all. Yet Argelander's idea of completeness as to numbers at some sacrifice of precision has rendered possible many statistical and other researches of far-reaching importance in stellar astronomy. But Argelander and his successor Schönfeld, observing at Bonn in Germany, were able to carry their survey of the heavens only a short way beyond the northern half. Gill, in his observatory at the Cape of Good Hope, far south of the equator, saw the possibility of extending Argelander's work to the south pole by means of photography. To have so extended it by the visual methods that were used by Argelander would have required a greater expenditure of time and labor than could have been spared from other and more pressing work. But a small photographic telescope was procured, and in the hands of a scientific photographer who was summoned from England (C. Ray Woods) a complete collection of plates of the southern sky was made. Gill found in Kapteyn of Gröningen, Holland, an efficient collaborator. The negatives were sent to Gröningen, and were there measured by Kapteyn. The resulting catalogue will fill three large quarto volumes, two of which have been published by the British government. It was found that the catalogue possesses greater completeness even than Argelander's. For the fallible human eye cannot avoid omitting a star now and then, while the photographic plate of course is never subject to any such error.

But the *Durchmusterung*, as we have said, is not to be the only result of Gill's 1882 comet photograph. It seemed to him that it might also be possible to attempt a new star-catalogue which should satisfy the condition of high precision as well as that of completeness as to numbers, provided the coöperation of many observatories could be secured. So vast an undertaking can be rendered possible only by the combined efforts of many astronomers and many observatories. As the result of preliminary correspondence, a meeting to consider the subject was called at Paris by the French government in 1887. Delegates from all the civilized nations attended. It was decided that the proposed photographic catalogue of precision should really be made, so that it might stand for all time as the foundation of future research

in sidereal astronomy—truly a fitting legacy to those who shall follow this closing 19th century. No less than eighteen observatories are taking a part in this work, and at the present time most of the plates for the great catalogue have been made. In some of the participating observatories the measurement of the plates has also been commenced. We may then hope to chronicle the appearance of the first installment of this greatest of catalogues at no very distant date. For the present we shall content ourselves with merely calling attention to the general principles of the work, which undoubtedly constitutes the most elaborate astronomical operation the world has yet seen. All the plates for the catalogue are being made in duplicate, so that the whole face of the sky will be covered twice. No less than 44,108 plates will be necessary for this, and each includes a surface of four square degrees. It is hoped by this duplication to make error of any kind practically impossible. All stars down to the eleventh magnitude are to be included in the catalogue, and the total number will probably not fall short of two millions.

For the myriad stars of still lower brilliancy a further series of plates has been projected, and these are also being made. It is not, however, intended to subject these to exact measurement. Such would involve an amount of labor surpassing the possibilities even of elaborate governmental coöperation. They will be simply reproduced photographically in charts for distribution to astronomers who may need them in their special researches.

With this very brief account we are compelled to dismiss the important subject of Astro-photography, referring the reader who may wish more detailed information to the following publications: *Bulletin du Comité Permanent de la Carte du Ciel*, Paris, Institut de France, Tomes I and II. Scheiner's *Photographie der Gestirne*, Leipzig, 1898.

Astro-physics.—This department of the science of astronomy will be treated under Physics (q. v.).

New Star Near Vega.—This was one of the first discoveries made by Barnard with the great Yerkes telescope. It is rather odd that it should have escaped notice hitherto, since a great amount of attention has always been given to the bright star Vega.

The Harvard Conference of Astronomers and Astro-Physicists, and the American Astronomical Society.—It will be remembered that when the great Yerkes observatory of the University of Chicago was formally opened in August, 1897, a large number of prominent astronomers and astro-physicists were invited to come to Chicago and take part in the opening exercises. These exercises were to include a series of conferences, at which the visiting scientific men were to present papers involving the results of their recent researches. It turned out that a very large number of distinguished men accepted the invitation of the Chicago authorities, and as a result these conferences became the most interesting of the various functions connected with the opening ceremonies of the new observatory. In fact, they seemed so important to the attending astronomers, that it was decided to give a certain permanence to the idea of astronomical conferences, by holding them once every year. Accordingly, an invitation was sent out by the observatory of Harvard University, asking astronomers and astro-physicists to assemble there in August 1898, for the presentation and discussion of scientific papers. No less than ninety-two persons responded by personal attendance at the Harvard conferences, and a number of others who were prevented from attending showed their interest by sending researches in manuscript which were read to the conference and discussed. It is impossible here to enter into a description of the many interesting papers presented. But the most important action consisted in the selection of a strong committee to consider the establishment of a formal American astronomical society. The committee consists of Professors Pickering, Hale, Comstock, Newcomb and Morley. It reported to the conference a general plan of formation for the society, and was continued as a council to perfect the organization. That the United States will at last have a permanent astronomical society has therefore now gone beyond the stage of mere probability. There can be no doubt that such a society is a great desideratum. Entirely apart from the entertainment and instruction obtained by the members at the annual meetings, such societies have a function of great importance to the progress of science. This consists in the prompt publication of scientific memoirs. It is true that many channels for such publication already exist. But a well-managed and influential society, having a strong editorial committee of specialists in charge of its publications, has been found to furnish the most effective method of bringing new work before the special public to which it will prove of interest.

The Double Star 61 Cygni.—Perhaps the entire sidereal heavens contain no case of greater present interest than this famous object. Composed of two separate stars of nearly equal brightness, and separated on the sky by only about seventeen seconds of arc, it has always been easily observable even in the smallest telescope. It has received particular attention on account of the two component stars having nearly the same "proper motion," both in amount and direction. In other words,

they are moving across the sky at very nearly the same apparent rate of speed, and with almost exactly the same objective point for their motion. This in itself would not be so very remarkable, were it not for the added peculiarity that the rate of motion of the two stars is among the largest known anywhere in the heavens, being no less than about five seconds of arc each year. That two stars should happen, by the mere effect of chance juxtaposition, to be so near each other on the sky, and should present such exceptionally peculiar similarity of motion, would seem too improbable to be considered for a moment. In fact, from an examination of the probabilities of the case, astronomers have long since concluded that the two component stars of 61 Cygni are no chance companions, but form integral parts of one and the same sidereal system. There has always been, however, one difficulty in the way of this explanation. If the stars really belong together, they are not simply *apparent* neighbors projected on the distant vault of the sky, and really separated by the profound depths of space. They must then be a true binary system, and it is but fair to expect them to exhibit the effects of gravitational attraction. In other words, we should find one of the stars revolving about the other, or at all events, both should have a revolution about their common centre of gravity. But in spite of all efforts to determine the elements of such supposed orbital motion, astronomers have not yet succeeded in proving its existence beyond a reasonable doubt. If, then, we have in 61 Cygni a real binary system, it must be built upon so vast a cosmic scale that the time limits of human observation have not yet sufficed to reveal the orbital motion. In addition to the above peculiarities of 61 Cygni, it possesses still one other distinction, which alone would put it in the front rank of astronomical importance. It is the first fixed star whose distance from the earth was ever measured. The great difficulty of all such measures of stellar distance has already been mentioned under STELLAR PARALLAX and ASTRO-PHOTOGRAPHY. Cygnus was the first constellation to yield a limit in space to the sounding-plummet of the astronomer. Bessel, the famous director of the Königsberg observatory, was the man who first succeeded in demonstrating the possibility of measuring stellar parallax; and the star which gave him the first successful result was 61 Cygni.

After this brief account of the scientific history of this star, we now proceed to explain why it has again come into special prominence this year. Of course the first parallax determination by Bessel was followed by other investigators, who sought to verify or disprove his result by attempting observation of the same star. The photographic process has also been applied to it by several astronomers, and notably by Wilsing, of Potsdam, whose results have only been published quite recently. Wilsing was able to verify Bessel's parallax pretty nearly. But he detected an entirely new and mysterious peculiarity in this star of many peculiarities. He discovered that the distance on the sky between the two components did not stay constant. It would appear that there is a pendulum-like swinging of the one component backwards and forwards in the direction of the other. The whole swing is rapid, as time is counted in sidereal astronomy. For only nineteen months are required to complete an excursion of the moving component back and forth. Wilsing was able to offer only one explanation of his discovery. He thought one of the components must be itself a close double, in which the companion star is large but non-luminous. Thus we see only the one star, but we can imagine it in rapid rotation about the larger dark star. This rotation might indeed carry it alternately nearer to and further from the other visible component. But the whole matter is still *sub judice*, awaiting verification by other observers.

As if we did not already have enough to puzzle us in this star, the old question as to whether the two visible components are really physically connected has been re-opened this year. Davis, of New York, has published a new discussion of Wilsing's observations, and comes to the conclusion that the major part of the discordances observed by him could be explained if we assume a difference in parallax for the two stars. That is, if we are willing to abandon the accepted hypothesis that the visible components belong together, and take them to be really very widely separated in space, we can get another fairly plausible explanation of Wilsing's results. Moreover, Davis has collated and compared all the numerous existing parallax determinations of the two components. He has also re-determined the parallax, using previously unpublished photographic observations by Rutherford, and he finds on the whole that the parallaxes differ quite materially for the two components, and concludes that our old theory is wrong. He considers that the two stars are probably not physically connected at all, and falls back on the old hypothesis of chance juxtaposition to account for their nearness and similarity of motion. On the whole, we may say that Davis has made out a pretty good case, considering the delicacy of the inquiry. But we doubt very much whether any of the parallax observations are of sufficient precision to make it altogether safe to rely very greatly on their evidence in the present case. The most we can do is to recognize the great interest attaching to the question now re-opened by Davis, and to hope that some further precise series of parallax observations will be undertaken soon.

Concerning 61 Cygni, see Davis, *Popular Astronomy*, Vol. VI. p. 487, and *Contributions from the Observatory of Columbia University*, No. 13; Bessel, *Astronomische Nachrichten*, Nos. 365-6; Wilsing, *Publicationen des Astrophysikalischen Observatoriums zu Potsdam*, No. 36.

Meteors.—A particularly magnificent display of the November Leonid meteors was expected for 1898, but only a very small number were actually observed. Possibly next year will bring us to the thickest part of the stream, in which case we may then see a display comparable to those recorded in the years 1833 and 1866.

Variation of Latitude and the Constant of Aberration offer two problems to astronomical science that are now pressing for a satisfactory solution. For many years it had been suspected that terrestrial latitudes might be subject to small changes, and that these might possibly affect the results of ordinary astronomical observations. But in spite of all efforts to detect with certainty the existence of such changes, it was not until the year 1888 that the latitude variation was transferred from the domain of mathematical speculation to the arena of practical astronomy. To Küstner (now director of the Bonn observatory) belongs the honor of having first proved beyond a doubt that latitudes vary by observable amounts. His observations were made in Berlin, and he found that the latitude of that place was less by two-tenths of a second of arc in the spring of 1885 than it had been in the spring of 1884. Moreover, he had the courage to announce his discovery without circumlocution as a fact really existing, not merely suspected. His result has been abundantly confirmed by subsequent observers.

Let us inquire a little more closely what is meant by this variation of latitude. If we imagine two straight lines drawn from the centre of the earth, one to the pole, and the other to a given observatory, then the angle between these two lines is called the co-latitude of the observatory. The latitude, in the ordinary geographical or astronomical sense, is obtained simply by subtracting this co-latitude from 90° . It is evident that the co-latitude (and therefore also the latitude) will remain constant for any given observatory, if the pole maintains an immovable position on the earth. Now for the proper understanding of the present problem, we must define exactly what we mean by the pole of the earth. If we disregard, as we may, moderate irregularities in the earth's surface, we can take its figure to be a slightly flattened globe or sphere. The shortest possible line through the centre, and limited by the surface at each end, may be called the *axis of figure* of the earth. The points where this axis meets the surface are the *poles of figure*. But the earth has still another axis, viz.: the *axis of rotation*. About this axis the planet revolves once in twenty-four hours, giving rise to all the diurnal phenomena of astronomy. Constancy of latitudes would imply the relative fixity of these two axes. That each shall maintain continuously exactly the same position with respect to the other is the one necessary and sufficient condition for perfectly invariable terrestrial latitudes.

Now it is the axis of rotation to which all astronomical determinations of latitude are of necessity referred; for we must needs depend on the rotation phenomena for defining observationally the position in space of our axis. If then the axis of figure be subject to a slow revolution about the axis of rotation, there will be a corresponding variation of astronomically determined latitudes. The maximum amount of the variation will be the same as the small angle between the two axes, and its period will be equal to the time required for the rotation of the one axis about the other. At the end of every such period, the latitudes of all places on the earth should return to their original values.

From what has been said, we may conclude that up to the publication of Küstner's work in 1888, fundamental astronomy had adopted invariability of latitudes as a fact practically established. All the results of astronomical observations made prior to that date must therefore be subject to so much error as might be produced by assuming a constancy of latitudes in the discussion of the observations. Now the aberration constant is particularly liable to error from this source. It is evident, therefore, that a re-determination of this quantity was imperatively needed, and that the necessary observations must be arranged in such a manner as to take account of the effect of latitude variation. Careful study of the problem brought out the fact that the two quantities involved are entangled in such a way that no available method of research could prove satisfactory, unless it had for its object the simultaneous determination of both aberration and variation of latitude. It seemed best to employ what is known as the "zenith telescope method," and the best modification of this was suggested by Küstner himself. It will be impossible here to enter into the details of this instrument, beyond stating that the observations, when made, must be continued more or less through the entire night. They are especially important in the early part of the night, and again just before sun-rise, so that the observer can usually have from two to four hours rest in the middle of the night. Moreover, the observations need to be made on every fine night for a period of fourteen months, if it be desired to determine the aberration. For the

latitude variation the observations must of course be continued for a term of years,—indeed they must be kept up as long as we wish to trace the polar motion. It will be seen that the problem is one of great difficulty, testing to the utmost the patience and endurance of the astronomer. Moreover, it is known, that just as in the case of the solar parallax, the precision can be enhanced by making a simultaneous series of observations at more than one observatory. If the participating observatories are situated upon the same parallel of latitude, or very near it, the results obtained will enjoy a further increase of precision. This was first suggested by Fergola of Naples. The advantage consists in the possibility of observing just the same stars at all the observing stations, so that the *differences* of latitude of the stations are determined independently of any knowledge of the exact positions of the stars on the sky. This is most important, for the stars' positions are never known with absolute precision, being themselves but the results of fallible human observation. Moreover, the polar motion can be deduced from the latitude-differences of the observatories just as well as from the actual latitudes. If, for instance, the pole happens to be moving at a given time towards an American observatory, it will be moving away from observatories in Japan or the Philippine Islands. So that if we can but measure from time to time the latitude-differences of observatories properly situated, we can get an accurate and complete idea of the actual motions of the pole. The International Geodetic Association, which includes all the civilized nations, has now undertaken the systematic observation of latitude variation. Four stations will be established upon a single parallel of latitude. Two will be in the United States, one in Japan, and one in Sicily. Two private observatories will also participate voluntarily. Systematic observations will begin, it is hoped, about the end of 1899. Thus international official enterprise will take up this important problem, which has hitherto been left to the efforts of universities or individual governments.

From what has been said, it will be seen that the latitude variation may be regarded as one of the problems of astronomy still very far from a complete and satisfactory solution. It is particularly noteworthy that within ten years of the present day, the older, or exact, astronomy should offer a new problem so fundamental in character. The science that has been called "the perfect science" has shown that it can still advance. The accepted constant of aberration must also be regarded as subject to slight correction, so long as the latitude problem remains unsettled, especially as the most recent aberration results exhibit rather large discordances among themselves. To this we have already referred under SOLAR PARALLAX, and have called special attention to the close inter-relation of the various problems discussed here. Before leaving this part of our subject, we would refer the reader who may wish more complete and technical information to a series of articles by Chandler of Cambridge, Mass., published in the *Astronomical Journal*, and to another series by Albrecht, of Potsdam, Germany, published in the reports of the International Geodetic Association, and also in abridged form in the *Astronomische Nachrichten*. An interesting account of this year's meeting of the International Association has been published in *Science* by the United States delegate, E. D. Preston, of the United States Coast and Geodetic Survey.

Variable Stars.—Sixty-two new variable stars have been discovered during the year, including thirty-six found at the Harvard College observatory. Besides these, the researches of Bailey have brought out the variability of an enormous number of stars in some of the denser star clusters in the Southern hemisphere. It would appear as though in some of the clusters a very large proportion of all the stars change their light periodically, now blazing up to an unwonted brilliancy, and again sinking to comparative invisibility. No satisfactory explanation of these interesting phenomena has yet been given. They acquire an added interest from the important fact that the phenomenon of variability is not universal, since many clusters which have been brought under special observation fail to exhibit it. On the other hand, the cases when it does occur are not at all rare. There can be no doubt that the elucidation of this matter would throw much light on the question of the constitution of stellar clusters.

Comets.—The following are the comets that appeared in the year 1898.

1898 *a* was discovered by Perrine at the Lick observatory January 1, and was a return of Winnecke's periodic comet.

1898 *b* was discovered by Perrine at the Lick observatory March 19.

1898 *c* was discovered by Coddington at the Lick observatory on June 11. It was first found by photography.

1898 *d* was discovered by Tebbutt in Australia June 11, and was a return of Encke's periodic comet.

1898 *e* was discovered by Perrine at the Lick observatory June 14, and was just bright enough to be seen with the naked eye.

1898 *f* was discovered by Hussey at the Lick observatory June 16, and was a return of Wolf's comet.

1898 *g* was discovered by Giacobini at Nice, June 19.

1898 *h* was discovered by Perrine at the Lick observatory, September 13.

1898 *i* was discovered by Brooks, October 20.

1898 *j* was discovered photographically by Chase at the observatory of Yale University, New Haven, November 14.

It will be seen that the comets of 1898, though exceptionally numerous, were of a comparatively unimportant character. None were conspicuous enough to attract public attention. No less than six of the ten discoveries were made at the Lick Observatory, and of the remaining four comets, two were first seen in this country. The American comet record is therefore a particularly good one this year, and the showing of the astronomers of the Lick observatory is especially creditable.

Planetoids or Asteroids.—The year 1898 will be counted as a memorable one in the history of these small but interesting members of the solar system. Ever since the discovery of the sixth little planet, which took place in 1847, not one year has gone by without its discoveries of asteroids. Yet though their number has thus grown steadily as time went on, the general characteristics as to size and peculiarities of orbit have remained quite uniform. But an asteroid was discovered in 1898 that differs from all the others, and in a manner that makes it perhaps one of the most important bodies so far known to astronomical science. Like most of the recent planetoid discoveries, we owe this new one to photography. We have already pointed out, under *Astro-photography*, that the discovery of planetoids is one of the great advantages of this method of research. In fact, since December 1891, when Wolf, at Heidelberg, found the first photographic planetoid, only seven out of 111 new discoveries have been made by visual methods.

The process of hunting planetoids by photograph is quite simple. Plates are exposed in a comparatively small camera for two or three hours. During all this time the camera is moved with its mounting by clock-work or otherwise so as to follow the stars as they rise or set, and thus make the little star-images all maintain quite unmoved positions on the plate. Now if there be a planetoid anywhere in the region covered by the photograph, it will not appear as a dot like the stars, when the negative is developed. For its orbital motion will make the planetoid travel slowly among the stars, and its trace on the plate will therefore be a short line, and not a dot. The presence of such a short line therefore at once reveals the planetoid. Subsequent calculations will then show whether the discovery is a new one, or merely a re-observation of one of the planetoids already known. In cases of genuine new discoveries, it has been the custom in recent years not to assign a number and name to the new planet until enough observations have been made in the various observatories to permit the computation of a fairly accurate orbit. Pending the accumulation of these necessary observations, a temporary designation is given to the planetoid, and by this it is known until a permanent number has been assigned to it. The computation of preliminary orbits, and the assigning of these permanent numbers has been by common consent left to the astronomers of the *Berlin Astronomisches Jahrbuch*, an annual astronomical publication of the German government. As temporary designations, the successive letters of the alphabet have been used. And when the alphabet was exhausted, recourse was had to doubling the letters. Thus after planetoid Z would follow AA, AB, etc.

The following planetoids discovered during 1897 and 1898 have received their permanent numbers:

No.	Temporary Designation.	Discovery	Date of Discoverer.	Name.
426	D H	Charlois	Sept. 11, 1898	Monachia
427	D J	Charlois	Aug. 13, 1898	
428	D K	Villiger	Dec. 18, 1897	
429	D L	Charlois	Dec. 18, 1897	
430	D M	Charlois	Dec. 18, 1897	•
431	D N	Charlois	Nov. 25, 1897	
432	D O	Charlois	Nov. 18, 1897	Eros
433	D Q	Witt	Aug. 27, 1897	
434	D R	Wolf	Aug. 25, 1897	Hungaria

Of these No. 433, known temporarily as D Q, and discovered photographically by Witt at Berlin, is the extremely interesting planetoid to which we have called attention. Its special peculiarity consists in the fact that it approaches the earth much nearer than any other planetoid, or, indeed, nearer than any other known body in the heavens except our own moon. Now we have seen under SOLAR PARALLAX that perhaps the best method of determining our distance from the sun is by observation of planetoids. The greatest difficulty, as we pointed out, consists in the smallness of the available base-line, as compared with the distance separating us from the planetoid under observation. It is therefore obvious that if we can get a nearer

planetoid, we shall do away in a measure with this difficulty. It is a fact that we may hope for a determination of the parallax by the aid of 433 D Q that will be at least twice as accurate as any made up to the present time. The next favorable opportunity for attempting a "parallax campaign" with this planetoid will occur at the end of the year 1900. There will be still more favorable opportunities in 1917 and 1924. Astronomers will doubtless take advantage of this chance to advance a step nearer their goal of complete exactness. That the past efforts of men and nations will perhaps be thus replaced by the results of more favorable opportunity is not to be called an example of the futility of human effort in science. The successes of a dead generation have ever been called failures by the living. Yet upon such a succession of failures are based the foundations of all modern exact science.

A New "Runaway" Star.—One of the most interesting, and at the same time unexpected results of the Cape Photographic *Durchmusterung* was the discovery of a small star endowed with an extraordinarily rapid motion on the sky. Up to this time, the star numbered 1830 in the catalogue of Groombridge had the most rapid motion of any known star. It is moving across the face of the sky seven seconds of arc each year. Only sixteen stars in all are known to have "proper motions," as they are called, exceeding three seconds, and of these nine exceed four seconds, and only four exceed five seconds. On account of its rapid motion, then, 1830. Groombridge has been called the "runaway star."

When Kapteyn was measuring the plates made at the Cape of Good Hope for the *Durchmusterung*, he found one star of the ninth magnitude, that was lacking in the catalogues made in previous years by Gould at Cordoba in South America, though these catalogues covered the region in which the star was situated. On the other hand, a star was given in Gould's catalogue close by, which was not on the photographic plates. He at once wrote to Gill, and asked him to examine the sky, and see if a mistake could by any possibility have been made by Gould. Observations were at once made at the Cape observatory by Innes, and he was able to show without difficulty that we have here a case of remarkably rapid displacement of a star on the sky. The motion amounts to no less than $8''.71$ annually. Astronomers attach the greatest possible importance to the discovery of such exceptional cases of rapid motion. For it is always by a study of the unusual that new scientific truths are brought to light. There can be no doubt that this discovery alone is sufficient to justify all the labor spent on the whole Cape *Durchmusterung*. It also emphasizes the correctness of Argelander's judgment in advocating the formation of star-catalogues that should be very complete as to numbers of stars, even at some sacrifice of high precision. For it is only by cataloguing *all* the stars that we can be sure of sifting out those cases that present the most important and interesting peculiarities. It is altogether probable that a study of the faint inconspicuous stars will lead to results of far-reaching scientific interest.

Lunar Photography.—The Paris observatory has continued the publication of Loewy and Puiseaux's photographs of the moon. These astronomers have been engaged for some time in trying to improve the methods of lunar photography, so as to obtain a thoroughly complete and satisfactory series of pictures of the lunar surface. For making the negatives they have used the *equatorial coudé*, or bent telescope of the Paris observatory. This is a unique instrument, invented by Loewy, the present director of the observatory. The telescope tube is bent at right angles near the middle, and the rays of light are similarly bent within it by a plane mirror fixed in the tube. By this arrangement many convenient changes in the construction and mounting of the instrument are made possible. But there is the compensating disadvantage that the optical system as a whole is rendered more complicated by the introduction of the extra reflecting surface. There can be no doubt that each additional optical surface is likely to add its share to the sum total of optical imperfection belonging of necessity to every telescope. Still the lunar photographs show that the Paris astronomers have succeeded in overcoming very completely all these difficulties.

The improvements made at Paris in the methods of reproduction of the original negatives for publication show a decided advance upon anything we have as yet seen. Of course the most important thing from the point of view of the astronomer is the production of an original negative which shall be an absolutely exact copy of what actually exists on the sky. If necessary, all studies of the picture can be effected upon the original negative, thus avoiding every possible change or imperfection that might be introduced in the process of reproduction. But after all the larger astronomical public is necessarily unable to visit personally the place where the original negative is preserved. So that very perfect processes of reproduction are almost as important in reality as perfect methods of making the original. In cases like photographing the moon for the study of its surface detail, it is only by submitting the picture to many pairs of trained eyes that we can make quite certain that no important peculiarity has escaped detection.

Venus and Mars.—The various observers of these planets continue to differ as to their surface markings, and as to the rotation period of Venus. A very elaborate volume of observations of Mars has been published this year by Lowell of the observatory at Flagstaff, Arizona.

The Proposed great Telescope for the Paris Exposition of 1900.—It has been known for some time that a telescope was in course of construction for the next great Paris exposition which should altogether surpass in size anything attempted hitherto in the direction of telescope making. The work on the instrument has now progressed so far that it is safe to regard it as certain that the instrument will become an accomplished fact, and it may therefore be of interest to give here some details in regard to it. The object glass is to have a clear diameter of $49\frac{1}{4}$ inches, being thus $9\frac{1}{4}$ inches larger than the next greatest telescope, mounted recently near Chicago through the munificence of Mr. Yerkes of that city. The new instrument is even to be provided with two separate object glasses of the above great size: One will be adapted for ordinary visual purposes, and the other will be ground of the form suitable for making photographs. Thus the immense light-gathering power of the new instrument will be utilized as well in the newer form of observation by photography as in the older and more accustomed method of observing with the eye. A very radical departure from usual methods of construction in the new instrument will be its extraordinarily large focal length, no less than 197 feet. The usual proportion is about one foot of focal length for each inch of diameter of the lens, which would give in this case a focal length of only fifty feet. The longer focal length has the important theoretical advantage that it enables the optician to get rid very thoroughly of the unavoidable faults of all lenses, the so-called chromatic and spherical aberrations. For it must not be supposed that perfect lenses can be made either theoretically or practically. All telescope lenses are necessarily imperfect, and represent in their results more or less complete approximations on the part of the optician to the desired but impossible, complete perfection of the focal image. But the adoption of the long focus for the Paris instrument brings with it an attendant disadvantage. If it be mounted in the usual way with pivoted axes, so as to enable the astronomer to point the telescope at any part of the sky, its excessive length and weight will make it quite unmanageable. They have therefore adopted what is known as the "fixed telescope" plan. The instrument is mounted horizontally, and is not capable of any motions at all. The various parts of the sky are then brought under observation by reflection from a plane mirror placed outside the object glass of the telescope proper.

The greatest difficulty of this form of construction is the required plane mirror. It is evident that it must be of considerably larger size than the object glass of the telescope, if there is to be no sacrifice of the light-gathering power of the latter in any of the possible positions of the optical system consisting of the lenses and the mirror. In the present case the mirror is to be about 79 inches in diameter. Truly a huge undertaking, when we consider how rapidly the difficulties of grinding an absolutely flat surface increase with its size. We are able to announce, however, that this mirror has been quite successfully completed so that the carrying to completion of the whole instrument may be regarded as certain. The glass discs for the two object glasses have also been successfully cast by Mantois, and these are now undergoing the process of grinding. When finished, these lenses will be mounted on a series of railway tracks, so that they can readily be interchanged, when it is desired to pass from visual to photographic observations. The great outside mirror will be mounted on what is called a siderostat. This is an arrangement of pivoted axes, permitting the mirror to be turned in any desired direction. It will also be connected with clockwork, so that any planet or star once brought under observation, can be held in the centre of the field of view automatically, without further special attention from the astronomer. The following table contains the principal dimensions of the instrument.

Table of the Dimensions of the Telescope for the Paris Exhibition of 1900:

Diameter of lenses.....	$49\frac{1}{4}$ inch.
Focal length.....	197 feet.
Diameter of tube.....	59 inch
Weight of tube.....	23 tons.
Thickness of tube.....	$\frac{1}{4}$ inch.
Weight of each lens.....	1323 lbs.
Weight of lens with cell.....	1984 lbs.
Length of focussing screw.....	59 inch.
Diameter of mirror.....	$78\frac{3}{4}$ inch.
Thickness of mirror.....	$10\frac{1}{2}$ inch.
Weight of mirror.....	4 tons.
Weight of mirror, with cell.....	7 tons.
Weight of siderostat.....	50 tons.

ASTRONOMICAL SOCIETY, AMERICAN. See ASTRONOMICAL PROGRESS.

ASTRO-PHOTOGRAPHIC CATALOGUE. See ASTRONOMICAL PROGRESS.

ASTRO-PHOTOGRAPHY. See ASTRONOMICAL PROGRESS.

ASTRO-PHYSICS. See PHYSICS.

ATHERTON, GERTRUDE FRANKLIN, American author, born in San Francisco, California, about 1858. She is great-grand niece of Benjamin Franklin. Her novels have been successful and include: *The Doomswoman* (1892), *American Wives and English Husbands* (1898), and *The Californians* (1898). She has lived in Europe since the death of her husband, George H. B. Atherton, a Californian.

ATMOSPHERE. See PHYSICS (paragraph Planetary Atmosphere).

ATWOOD, MELVILLE, scientist, died at Berkeley, California, April 25, 1898. He was born near Stonebridge, Worcestershire, England, July 31, 1812; went to the gold and diamond mines of Brazil; made a discovery in 1840 that increased the value of zinc ore; and in 1852 went to California and invented and introduced the blanket system of amalgamation. Mr. Atwood was one of the best known lithologists, microscopists, and geologists on the Pacific coast; he was a member of the Academy of Science and of the Microscopical Society of San Francisco, and a fellow of the Geological Society of London.

AUDUBON SOCIETY. See ORNITHOLOGY (paragraph Organization).

AUGUR, CHRISTOPHER COLON, was born in 1821 and died January 16, 1898. Having been graduated from West Point, he served in the Mexican War and in Indian conflicts. He was Major-General of volunteers in the Civil War; was wounded at Cedar Mountain; at close of war was brevetted Major-General; retired July 10, 1885.

AUSTRALASIAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. See ZOOLOGICAL SOCIETIES (first paragraph).

AUSTRALIA, WESTERN. See WESTERN AUSTRALIA.

AUSTRALIAN FEDERATION. An important event in the history of Australia during the year 1898 was the continuation of the movement for Australian Federation. For a number of years the idea of federation has been gaining supporters in all of the colonies, and on March 22, 1897, the Australian Federal Convention, consisting of ten delegates from each colony (except Queensland) elected by the people, held its first session at Adelaide. The federation movement, resulting in no way from military or external causes, developed chiefly by reason of the homogeneity and the mutual affinities of the inhabitants of the several colonies. At Adelaide Messrs. Barton and O'Connor, of New South Wales, and Sir John Downes, of South Australia, all lawyers of recognized ability, presented a constitution which they had drafted and which was adopted by the Convention and submitted to the several legislatures. In the following September the Convention met again, at Sydney, to consider the suggestions offered by the legislatures, but it adjourned in a week in order that Queensland might have time to choose delegates. None, however, were chosen by this colony, and, indeed, Queensland has thus far taken no part in the federation movement. The last session of the Convention was held at Melbourne, beginning Jan. 20, 1898 and adjourning *sine die* March 17th. The sessions of the Convention were marked by good feeling and a spirit of fairness and reasonable compromise on the part of most of the delegates.

The constitution framed at Melbourne was evidently based on the constitutions of the United States, Canada, and the Swiss Republic. Its main provisions were as follows: The Federal legislature was to consist of the Queen, represented by a Governor General; a Senate, in which each colony, or state, was to be equally represented by members chosen by popular vote; and a House of Representatives, whose members were to be proportionate to population. A cabinet was provided for and a Federal Supreme Court, the functions of which were to be similar to those of the American Supreme Court, and the judges were to remain in office during good behavior. The Senators were to hold office for six years, one half of them to be elected every three years; the members of the House of Representatives to be elected for a term of three years. The most marked digression of the constitution from the American system was in the establishment of a responsible ministry. Legislative power was to be divided between the Federal government and the States as in America; that is, the states to retain all powers not given to the Federal government. Among the subjects exclusively under Federal legislation were "commercial relations with other countries and among the several states, customs and excise, posts and telegraphs, military and naval defense, navigation and shipping, banking and currency, marriage and divorce." It was provided that money bills must originate in the House of Representatives; these the Senate, might accept or reject, but not amend. In the case of a deadlock between the two houses both were to be dis-

solved, and if the deadlock continued, two-thirds of both houses in joint session should decide the point at issue. In order to amend the constitution a majority vote in both houses first would be necessary; then the question would be submitted to conventions in the several states elected by majority vote of the people; and finally to become a part of the constitution it would be necessary that the measure be approved by a majority of these conventions.

The constitution was to be voted upon by the different Australian states, a fixed minimum for the affirmative vote being imposed in each state. If three colonies should ratify the constitution, the Convention agreed that federation might be accomplished and that application might be made to the Imperial Government for an enabling act. In New South Wales the minimum affirmative vote was raised from 50,000 to 80,000. This provision wrecked the federation measure. It was found when the returns came in from the June elections that while in general the majority for federation was almost two to one, the number of votes in New South Wales fell below the minimum limit. The vote in the several colonies for and against federation was as follows: Victoria, affirmative, 93,473, negative, 20,570; South Australia, affirmative, about 26,000, negative, about 16,000; Tasmania, affirmative, 13,496, negative, 2,900; New South Wales, affirmative, 70,990, negative, 65,619. West Australia cast no popular vote. Queensland was said to have no aversion to federation, but preferred to follow the example of New South Wales. With only three colonies voting in the affirmative, and two of these being relatively unimportant, it was thought best not to ask for the enabling act. A proposition was made looking to the adoption of such provisions in the constitution as would meet the wishes of the people of New South Wales, but the other states objected to this, and it is not clear how the difficulty can be got over.

With so great a majority in the colonies in favor of federation the action of New South Wales was bitterly disappointing to many, but on some accounts it seemed fortunate that the adoption of the minimum principle excluded her, for if she had joined the federation at this time her course would have been constantly hampered by a strong and hostile minority. The new constitution would have become a party issue in New South Wales and from the very first would have encountered vigorous opposition. It should be remembered that both Queensland and Victoria were carved out of New South Wales. It was not to be expected that the parent colony would occupy a subordinate position. Yet had she entered the federation at that time she could not have hoped that Sydney would be the seat of the new government, and she would probably have been thwarted in her free trade preferences. Some of the objections urged in New South Wales against the proposed constitution appear from the demands of the government for the following modifications: The federal capital should be located in New South Wales; the colony should exercise full rights of control over New South Wales rivers; the surplus of the revenue should be distributed per capita; bounties should be paid by the states granting them and not by the commonwealth; if the control of the railways be assumed by the states the debts must also be assumed. Objections were also made to the provision regarding the colony's portion of the contribution of the revenue to the commonwealth, and to the clause providing for equal representation in the Federal Senate; and New South Wales also demanded that the power of appeal to the privy council should be continued. Mr. Reid, Premier of New South Wales, suggested a new conference to consider a modification of the act of federation so as to meet the wishes of the people of New South Wales, but the other premiers refused to accept this proposition.

In some quarters it has been proposed that a limited federation be formed to consist of the three colonies which adopted the act of federation, namely, Victoria, Australia and Tasmania. With this as a nucleus, it was hoped that a complete federation would gradually result.

AUSTRIA-HUNGARY, an empire lying in the interior of Europe with an area of 240,942 sq. m. and a population on December 31, 1890, of 41,358,886, but as estimated in 1896, 43,800,213.

Agriculture and Mining.—There is a great variety in the raw products of Austria-Hungary. The chief occupation is agriculture, which is said to furnish employment to nearly three-tenths of the population. According to the figures for 1896 the leading crops of cereals in Austria were oats, rye, barley and wheat. In Hungary wheat was the most important crop and next to this were buckwheat, oats, barley and rye. Nearly 44 per cent. of the total acreage of Hungary consists of arable and garden land and nearly 37 per cent. of that of Austria. Forests abound, especially in the Carpathians, Alps and Central mountains of Austria-Hungary. They are administered by the state. The mineral wealth of the empire is considerable. The chief mineral products are coal, iron ore, pig iron, salt, silver and gold.

Foreign Trade.—The following statistics of the foreign trade of Austria-Hungary are taken from the United States Consular Reports for 1898. The total value of

the imports, exclusive of precious metals, amounted during the calendar year 1897 to \$308,680,000, and of the exports to \$314,000,000, having a balance of trade in favor of the empire of \$5,318,600, a loss of \$22,330,000 as compared with the previous year. The chief imports in 1897 were, in the order of their importance, cotton, grain, wool, coal and coke, silk and silk goods, coffee, tea and cocoa, flax, hemp and jute, machines, etc., iron and iron-ware, wine, fat and grease, and cotton yarn, and of these the largest increase in 1897 over the previous year was in grain. The other imports which showed an increase were wine, fat and grease, flax, hemp and jute, silk and silk goods, iron and iron ware and cotton. All the other imports mentioned showed a decrease. From this it will be seen that the importation of raw products in 1897 especially increased. There was also a large importation of manufactured products, being a considerable increase over the previous year. The principal articles of export in 1897 were, in the order of their importance, timber, mineral products, sugar, live stock, grain, leather goods, coal and coke, glass and glassware, beverages, woolen goods, paper, paper goods, etc., iron and iron ware, cotton goods, and linen goods. of which timber showed the greatest increase. There was also an increase in the exports of coal and coke, mineral products, beverages, cotton goods, paper, paper goods, etc., linen goods and woolen goods. The exports of the other products showed a falling off.

Commercial Policy of the Government.—The Imperial and Royal Ministry of Commerce has the chief management of commerce, industry, shipping, posts, telegraphs and telephones. Its duties include the initiation of negotiations for the conclusion of commercial treaties, the rendering of aid in the regulation of tariff, the management of commercial and industrial affairs, the rendering of aid in the promotion of industry, trade and commerce, etc. The government does much to encourage the development of trade. It assists the merchant marine by certain bounties or allowances and it remitted taxes upon all kinds of vessels from 1894 to 1898, inclusive. There are numerous industrial schools maintained by the state and a few supported by the separate provinces and receiving subventions from the state. It was reported in 1898 that in Austria there were 8 schools for the glass industry, 16 for lace and embroidery, 18 for basket ware. There were besides 15 state industrial schools, 4 art schools and 393 independent trade schools. For commercial education there were 12 high schools, 28 commercial high schools and 79 schools for advanced instruction. It was reported that the wide extent of technical education had favorably affected the export trade. The tariff policy of Austria-Hungary is that of moderate protection which resulted from the opposition of free trade tendencies manifested in the early seventies. It was alleged that the low tariff injured branches of the textile industry. In 1875 a return to a protective tariff policy was demanded with such emphasis that the government resolved to terminate the supplementary treaty with England. In 1878 the duty was increased on some classes of manufactured goods. Commercial treaties exist with all the principal European powers but in general the government persists in a policy of moderate protection.

Manufactures, etc.—The following statement of the chief causes of the decline of the manufactures of Austria-Hungary is quoted from the United States Consular Reports for September, 1898:

"(1) The conservatism of the people. While the English and German manufacturers are largely cosmopolitan, the Austrian remains provincial and strongly conservative. Innovations are still painful to him. He accordingly fails to keep abreast of the times and is distanced in the race for industrial and commercial supremacy.

"(2) High railroad rates. This is a mountainous country; the construction, as well as the operation, of railroads is expensive, and rates are correspondingly high. Austria's manufacturing centres, lying in the very heart of the European continent, are favorably situated with respect to inland traffic, but are at a great disadvantage in export trade. Moreover, while Austria furnishes Germany with a great deal of through traffic, and thus lowers the general cost of transportation in the latter country, she receives very little through freight from Germany in return.

"(3) There is a lack of mechanical skill in the southern and eastern portions of the monarchy, and, as such skill is largely the product of evolution, manufacturers have found that they can not afford to train a race to the manual arts.

"(4) High taxes. It is said that industrial enterprises are taxed more heavily in Austria than in Germany; and, as capital, like water, always follows the course of least resistance, it is not strange that movable plants occasionally cross the frontier.

"(5) Internal dissensions. Much of the energy of Austria which might be used in the development of her industries and foreign commerce seems to be consumed in race animosities at home. While in the German empire we find new industrial and export associations daily springing into life, the people of Austria seem to be absorbed just now in founding German, Slavic, or Italian clubs. Moreover, in the industrial centres of Bohemia, there is constant friction between the German manufacturer and his Slavic workmen, greatly impairing the efficiency of both.

"There is now a movement on foot in Hungary to bring about her 'economic emancipation' from Austria. It must be remembered that since the *Ausgleich* of 1867 the tariff union of the two halves of the monarchy rests only upon the precarious foundation of a treaty. Should the Hungarians refuse to continue the present arrangement, Austria's industries would doubtless sustain a terrible loss, and many now flourishing establishments would be crushed. The agricultural products of Hungary would in a measure have to find a new market, and the industrial interests of the two countries would probably suffer."

Railways, Telegraphs and Posts.—The length of railways open to traffic in Austria in 1896 was 10,240 miles; in Hungary in 1895, 8,375 miles; in Bosnia and Herzegovina, in 1897, 480 miles. In 1896 there were in Austria 30,495 miles of telegraph line and the number of messages carried was 13,213,633. In Hungary in 1895 there were 13,604 miles and the number of messages carried was 6,969,643. In 1896 there were in Austria 740,904,060 letters and postal cards carried in the mail and in Hungary in 1895 152,889,000.

Finance.—The finances of the empire are complicated by the necessity of distinguishing the revenues and expenditures for the whole empire from those for Austria and Hungary respectively. According to the *Ausgleich*, the nature of which is described in a succeeding paragraph, the cost of administering the common affairs of the two divisions of the empire is divided in a certain proportion between Austria and Hungary. The estimates for common affairs for 1898 place the revenues as 161,185,025 florins, the florin being equivalent to 20.3 cents in United States currency. In 1897 the general debt of the empire was 2,762,752,000 florins. Austria's special debt was 1,490,373,000 florins and Hungary's special debt 2,177,685,000, making a total of 6,430,810,000 florins. There is in addition a common floating debt which at the beginning of 1897 amounted to 138,949,109 florins.

Currency.—Since 1892 Austria-Hungary has been trying to rid itself of the evils which inevitably result from an unstable paper currency. A commission was appointed to examine the question in that year and reported in favor of the adoption of a gold standard. Since then it has been the policy of the government to redeem bank notes upon demand in gold and retire them. The government notes sank from 343,970,577 florins in 1892 to 119,315,410 florins at the close of the year 1897, and the latter amount was covered by a gold redemption fund in the treasury. The bank notes were increased during the same period, but a much larger proportional gold reserve was held in the vaults to redeem them. In the meanwhile the stock of gold in the country increased to the extent of 300,000,000 florins. The policy of Austria-Hungary, therefore, has been to reduce government notes and to substitute for them bank notes along the line of reform which is demanded by a party in the United States. (See article CURRENCY REFORM.) The monetary unit is the crown, which is worth 20.06 United States money. Between the passage of the law of August 2, 1892 and December 31, 1897, there were coined 963,824,100 crowns of gold, and 158,687,000 crowns of silver.

Labor Interests.—On October 1 the new department entitled Imperial and Royal Department of Labor Statistics entered upon its duties, which were to consist in collecting and publishing labor statistics for the information of legislators. It was created by a resolution of the Emperor.

Government and Political Situation.—In order to understand the political situation in Austria-Hungary it is necessary to speak of two or three points in the constitution and review the events of 1897. The Austro-Hungarian monarchy was established by the law of December 21, 1867. It consists of Cisleithania, or the Austrian empire proper, and Transleithania, or the Hungarian kingdom, each being subdivided into provinces. Besides the provinces included in these divisions there are Bosnia and Herzegovina, which have been administered by Austria since 1878, but are legally dependent on the Porte. In each province of the empire there is a local diet, having charge of its home affairs. The imperial parliament or *Reichsrath* consists of a house of lords and a house of deputies. Hungary also has a parliament similarly constituted at Budapest. The house of lords is composed of ecclesiastics and members of the privileged classes, and the lower house comprises representatives from the towns, chambers of commerce, and the rural districts, elected partly by direct and partly by indirect vote. The Emperor appoints the ministers, who may retain office even if they have not a majority in the house. They can be removed only by impeachment. The Minister of Foreign Affairs, Minister of War, and the Minister of Finance manage the common affairs of the two divisions of the empire, but the legislation in regard to these common affairs is in the hands of a board of Delegations (*Delegationen*) chosen from both houses of the *Reichsrath*. The division of the budget between the Austrian and Hungarian governments has been secured by a decennial compact called the *Ausgleich*, by which Austria is required to contribute 68 $\frac{1}{10}$ per cent. and Hungary 31 $\frac{1}{10}$ per cent. The Austrians have latterly complained of the excessive contribution which this arrangement lays on them. As the date of its

expiration (Jan. 1, 1898) approached, an effort was made to bring about a provisional arrangement for a year, in order that an agreement might be reached for a new *Ausgleich*. It was the struggle over this so-called *Provisorium* which led to the disgraceful scenes in the Austrian parliament in 1897; but the real difficulty lay in the racial question, particularly in the dispute over the use of the Czech tongue as the official language in Bohemia. The greater portion of the population of Bohemia, Moravia and Silesia is Czechish, the Germans constituting about three-eighths. The latter have complained of oppressive government and demanded a separate administration. A decree was issued by Count Badeni in the spring of 1897 permitting the use of the Czech tongue in lawsuits in any court of Bohemia even where the Czechs numbered only a small fraction of the population. The Germans declared this a violation of the constitution and after opposing it in many ways finally resorted to obstructive tactics in the *Reichsrath* on the occasion of the debates over the *Provisorium*. This was the main cause of the confusion that so long reigned in that body, but there is great difficulty even under favorable circumstances in legislating for such discordant peoples as compose the empire. In Austria-Hungary it must be remembered there are eleven different languages spoken. Even in the army the utmost confusion has prevailed on account of this racial diversity. In the *Reichsrath* the members carry on their discussion each in his own language and but few are able to follow the speeches of all.

Political Parties.—The poles are the most numerous political party in the *Reichsrath* and have attempted to gain control of the house with the idea of winning for themselves self-government in Galicia. Another strong party is that of the Czechs, who aim at the withdrawal and the detachment of Silesia, Bohemia and Moravia from Cisleithania. Their ultimate aim is also self-government, but they are divided among themselves into a conservative and radical element, known respectively as the Old Czechs and Young Czechs, the latter having strong Panslavist tendencies. Other political parties as enumerated by an Austrian writer in a recent article are the Conservatives, comprising the nobility and the Roman Catholic clergy, whose principal aims are the reestablishment of clerical influence over the schools, the retention of class privileges and opposition to any democratic innovations; the Catholic People's Party differing somewhat from the former on economic questions, but having substantially the same ecclesiastical aims; the Southern Slavs who aim at the formation of a South Slavonic state including Slavonia, Croatia, Dalmatia, Bosnia and Herzegovina; the Christian Socialists who are in reality Anti-Semites; the German Pro-class privileges and opposition to any democratic innovations; the Catholic People's Party which aims at securing the ascendancy of German influence and whose more radical members desire an actual union with Germany; the Italians who wish a union with Italy; and various socialistic and democratic groups. In the Hungarian parliament the condition is similar. The members of the Liberal Party who favor the union with Austria on the basis of the compact of 1867 are progressive in educational and ecclesiastical matters, but arouse racial bitterness by their constant effort to Magyarize Roumanians, Germans and Slavs. The minority consists of the clerical or Roman Catholic Party and the radical or Independent Party. The latter desires a mere personal union with Cisleithania, aiming at complete independence for Hungary. Hungarian politics are further complicated by the desire on the part of the Germans from Transylvania to keep their nationality, by the efforts of the Roumanians to secure a union with Roumania and by the Croatian hostility toward Magyar domination.

HISTORY.

Disturbances in the Reichsrath.—In November, 1897, the trouble in the *Reichsrath* reached a crisis. The German members angered by a ruling of the President, Dr. Abrahamovitch, seized the tribune and held it against the officers of the *Reichsrath* who tried to dislodge them. A fight followed and several members were hurt. The friends of the President now adopted a code of signals by which they were able to carry on parliamentary business in spite of the noise and confusion. This so enraged the Germans that they made a violent attack on the president who was saved only by calling in the police. Popular outbreaks took place in Vienna, as a result of these disturbances in the *Reichsrath*. On the 28th of November, Badeni resigned and it was announced that Baron Gautsch von Frankenthurn would assume the premiership. This was hailed by the Germans as a triumph for their side. It was followed by Czechish outbreaks in Prague and other towns of Bohemia. The Germans were set upon by the rabble and their houses were plundered. The new ministry promised to modify the language ordinances, and adopted a conciliatory policy toward the Germans. This policy was followed also by the ministry of Thun-Hohenstein. When the *Reichsrath* assembled on March 21, 1898, regular business was conducted. The Hungarian parliament passed an act continuing the terms of the old *Ausgleich* till the end of 1898, but the Austrian house did not agree to it. In the summer of 1898 the

old trouble in the Austrian body arose. In the first days of June it was evident that no parliamentary business could be transacted on account of the constantly growing hostility between the Czechs and the Germans. As a matter of necessity both parties acquiesced in the assumption of extraordinary authority by the Emperor who, it was supposed, intended to modify the language law in favor of the Germans.

Agrarian Troubles.—Throughout the year 1898 there arose Agrarian disturbances in Hungary. One of the reforms aimed at was the subdivision of large landed estates. At Budapest a mass meeting was held by agricultural laborers, and demands were made for an eight hour law, free education, universal suffrage, secret ballot and the abolition of the army. In Galicia too there has been Agrarian discontent as well as a violent outbreak of Anti-Semitism. See AGRARIAN MOVEMENT and HUNGARY.

Continuance of the Language Dispute.—During the war between Spain and the United States, Austrian sympathies were decidedly on the Spanish side, but the disorganized condition of her own internal affairs made it evident that even if she had wished she would have been unable to act with any vigor against us. In the summer of 1898 it was apparent that these dissensions over the racial questions were increasing rather than diminishing. The Emperor carried on the administration as an autocratic ruler. The agitation of the German element against the Badeni ordinances became more violent than ever, and at last these ordinances were repealed. On their face they would not seem to work injustice to either party, for they merely provided that the two languages should be on the footing of absolute equality. All officials in Bohemia had previously been required to know German, and the change would not seem to have been unfair to the Germans. Yet the latter urged that while educated Czechs spoke German, it was unjust to require Germans to speak what was merely a Slav dialect. The German language, they urged, was the language of a great commercial and literary nation and was spoken all over the world. Besides this there were upwards of seventy administrative districts in Bohemia where the Slav element amounted to only one per cent. of the population. It was regarded as absurd that a letter-carrier in these districts should be required to write and speak the Czech language. But the question rests on a broader basis. It involves the whole relation of the two races. Although Bohemia surrendered her crown to the Hapsburgs with the understanding that her independence should be unimpaired, there has been for centuries an effort to crush out the national spirit of the Slavs. German colonists were planted there and everything was done to impress the German character upon the people. The Germans regarded the Slavs as an inferior race. Rather than admit their equality they would apparently have preferred a union with the German Empire of the Hohenzollerns. The Hungarians sympathized with the Germans in their struggle for they too had a dread of Czech influence. The repeal of the ordinances of Badeni was regarded as a triumph for the Germans. It left the Bohemians the aggrieved party and had in it an element of danger from the fact that it might tend to increase their friendship for Russia, and their hope for the formation of a new Slavonic state whose autonomy should be guaranteed by the great power of the north.

The session of the *Reichsrath* closed in June after new riots in consequence of the suspension of the municipal council in the city of Gratz. The ministry worked along at the language ordinances in an effort to adapt them to the wishes of both parties, but in vain. The Delegations which met at Budapest on May 9 could come to no agreement on the military and naval budget, and a joint commission afterwards formed to determine the quotas from Hungary and Austria could not unite on any terms.

Change in the Tactics of the Opposition.—The opposition of the Austrian Germans to the language ordinances was intense. For nearly a year they had obstructed all parliamentary action, and in the spring of 1898 they bound themselves in a league which should fight every government that maintained the language decrees. By their obstructive tactics they hoped to make parliamentary government impossible and to prevent the conclusion of the *Ausgleich* with Hungary. When parliament was summoned at the close of September, 1898, the opponents of the government were still sanguine over the success of the obstructive policy. Suddenly, however, these German factions changed their tactics entirely. They declared, with the exception of the small Schoenerer group, that they would abandon obstruction and discuss the *Ausgleich* amicably. They based this change of policy on the somewhat childish ground that the government had counted on the continuance of the obstructionist tactics, and that it was the duty of the opposition to disappoint the government. This "policy of perversity," as it was called, is said to have rested on a very different ground. This was the expectation that the Thun cabinet would checkmate the opposition, if it persisted in its policy, by dissolving parliament, repressing agitation by means of imperial decrees and then making an arrangement with Hungary as to the *Ausgleich*. Accordingly the opposition faced about and made a virtue of necessity, claiming that it changed its policy of its own free will. Whether or not this account

of the matter is complete and impartial, the fact remains that the opposition desisted from its obstructionist tactics and parliament set to work quietly to discuss the *Ausgleich* bills, presumably with the intention of rejecting them in the end.

There was peace for a time but in October dissension showed itself in the German party. In November a motion to impeach the Premier was rejected amid scenes of disorder. The parliament then went on to discuss the impeachment of ex-Premier Badeni. The commissions to adjust quotas of Austria and Hungary in the naval and military budget met again in October, but came to no agreement.

Anti-Semitic and Other Disturbances.—Among the other political disturbances of the year were various Anti-Semitic and racial disorders in several parts of the empire. Vienna continued to be the centre of Anti-Semitism, whose apostle and principal leader is Dr. Lueger the burgomaster; but the most violent outbreaks of the craze occurred elsewhere. In June the peasantry in Galicia broke out into Anti-Semitic riots on two occasions. On the first, they entered the towns, mobbed the Jews, and destroyed much property both public and private. On the second, riots broke out in more than thirty villages and resulted in the deaths of sixteen Jews. The troops put down the riots and killed several of the rioters. Martial law was declared in two districts in June, and in a large part of the country the minor stage of siege was established. The assassination of the Empress led to outbreaks against the Italians, especially at Trieste, where a German-Italian fracas took place resulting in six deaths. Anti-Italian demonstrations also occurred at Gratz and in many other parts of the empire.

The Jubilee.—On May 8 the celebration of the jubilee of the Emperor Francis Joseph began with the opening of an exhibition to illustrate the industrial and agricultural progress of the reign. Other features of the celebration began in July but they had not yet come to their climax in the shape of a formal celebration of the anniversary when the public mind was thrown into consternation by the murder of the Empress, by the Italian anarchist Luccheni on September 10. (See the article ELIZABETH, EMPRESS OF AUSTRIA.) On account of this bereavement the plans for further jubilee festivities were postponed. The celebration was resumed on December 2, and was observed by ceremonies in the churches and schools and at the army posts. Ceremonies were also held at Paris, Rome, Berlin and other foreign capitals. The Emperor publicly thanked the army for its loyalty and bravery throughout the reign, and the anniversary was also celebrated by the granting of amnesty to political offenders in Hungary and by the remission of penalties inflicted for various offences including that of *lèse-majesté*. The affection with which all Austro-Hungarian subjects regard the Emperor Francis Joseph was shown unmistakably during the anniversary celebration.

Relations with Germany.—The expulsion of Austrian Slavs from Prussia, of which an account is given in the article GERMANY (q. v.), aroused much indignation in Austria. This policy was pursued by Prussia with rigor during the autumn of 1898, and early in December evoked a statement from the Premier, Count Thun, which caused considerable comment in political circles throughout Europe. He stated that the foreign office had repeatedly protested against these expulsions and had received in return reassuring promises, but that if Prussia continued to disregard the treaty rights of Austrian subjects the government would take active measures to defend these rights. This was taken in some quarters as a sign that the *Dreibund* or triple alliance was on the point of dissolution.

At the close of the year the *Ausgleich* dispute still seemed far from settlement, but it was reported at the end of December that the existing arrangement had been continued by imperial decree. For an account of the violent scenes that marked the discussion of this question in the Hungarian parliament toward the close of the year, see the article HUNGARY.

AUSTRIAN ARCHÆOLOGICAL INSTITUTE. See ARCHÆOLOGY.

AUTHORS' CLUB, an organization of American authors, was organized in 1882. President, Frank R. Stockton; Secretary, Rossiter Johnson. 155 members. Headquarters Carnegie Building, New York.

AUTOMATIC WRITING. See PSYCHOLOGY, EXPERIMENTAL (paragraph University of Iowa).

AUTOMOBILE. This is the generic name covering all forms of self-propelling vehicles for use upon country roads or city streets, whether driven by steam produced by the combustion of fuel, stored steam, compressed air, oil or gasoline engines, or by electric motors taking current from accumulators. From first to last a variety of names have been applied to such vehicles, some taking their title from the exact form of motive power, such as steam carriage, electric cab, others called motor-carriages, auto-trucks, etc.

Contrary to the general impression, automobiles, or motor vehicles as they should

be called, are not of recent origin, but date back to the early days of the steam engine, to the time of Sir Isaac Newton who in 1680 proposed a form of steam carriage, which at best could be nothing but a toy, but it embodied the essential features of a steam automobile. It consisted of a suitable carriage supporting a steam boiler provided with a nozzle projecting to the rear, from which steam issued under considerable pressure. The reaction upon the boiler drove the carriage ahead. In 1790 Nathan Read patented and constructed a model steam carriage in which two cylinders operated racks running in pinions on the driving shaft. The first actual experiments were made in 1769 by a French army officer, Nicholas Joseph Cugnot, who built a three wheel carriage. Later in 1770 he built another and larger carriage, still preserved in the *Conservatoire des Arts et Métiers*, Paris, which was intended for the transportation of artillery. The engine of this consisted of two 13-inch single acting cylinders connected by means of pawls to the single front wheel of the wagon. In front of this wheel was suspended the tank-like boiler. In 1784 James Watts' assistant, a man named Murdock, constructed a model carriage operated by a grasshopper steam engine, which as a model was most successful. In America Oliver Evans as early as 1786 suggested a form of road wagon, and in 1804 made estimates and calculations which he laid before the Lancaster Turnpike Co., to show that a steam road wagon could be constructed to transport 100 barrels of flour 50 miles in 24 hours, at less expense than 10 wagons drawn by 5 horses each could do the same work.

About 1786 William Symmington constructed a motor carriage which was successful enough to be mentioned. In 1803 Richard Trevithick built a full sized carriage which was exhibited in London, having driven itself 90 miles *en route* from Camborne where it was constructed. In 1821 Julius Griffiths of Brompton, Middlesex, England, and later in 1822 Goldsworthy Gurney, Burstall, and Hill all constructed steam carriages. David Gurney in the year 1827 built and operated a steam carriage which included all such features as using steam expensively, feed water heating, superheating of steam, a forced draft, tubular boiler, etc., and may be regarded as the first really practical motor carriage. In it Gurney made frequent and long journeys covering at times as much as 85 miles in 10 hours. He was excelled by Walter Hancock, who after considerable experimenting established several steam stage lines for passenger traffic. One of these vehicles ran between Cheltenham and Gloucester for 5 months, making the trip of 9 miles in 55 minutes, traveling a total distance of about 3,500 miles and carrying 3,000 passengers without delay or accident. He alone constructed 9 carriages capable of seating 116 passengers while at that time there were in operation in or near London 20 steam carriages. This boom was met by hostile legislation brought about by coach makers and operators, and the competition of steam railways rapidly growing into a useful form, and was given such a check that almost nothing was done during the following 25 years. An example of how well the subject was understood at that time is afforded by the report of a committee of the British House of Commons, appointed in 1831 at the height of the dispute. The report concluded:

1. That carriages can be propelled by steam on common dirt roads at an average rate of 10 miles per hour;
2. That at this rate they have conveyed 14 passengers;
3. That their weight, including engine, fuel, water and attendants may be under three tons;
4. That they can ascend and descend hills of considerable inclination with facility and safety;
5. That they are perfectly safe for passengers;
6. That they are not (or need not be, if properly constructed) a nuisance to the public;
7. That they will become a speedier and cheaper mode of conveyance than carriages drawn by horses;
8. That, as they admit of greater breadth of tire than other carriages, and as the roads are not acted on so injuriously as by the feet of horses in common draught, such carriages will cause less wear of roads than coaches drawn by horses;
9. That rates of toll have been imposed upon steam carriages, which would prohibit their being used on several lines of road, were such charges permitted to remain unaltered.

Following this set-back to motor carriage experimenting little or nothing was done, now and then a sporadic attempt would be made to revive an interest in the art, but it is only within recent years that any real work has been accomplished. Within recent years, say the last five, the construction of automobiles was entered into with such a rush that it is beyond the scope of this article to attempt to explain all the various machines that have been developed. All may be classified, however, under vehicles propelled by motors, which come under the following heads. 1. Steam boilers and engines, burning coal or coke, burning compressed or special fuels, burning petroleum, crude or refined, burning gasoline. 2. Oil or vapor engines, petroleum, gasoline, naphtha, acetelyne. 3. Compressed gases, air, carbonic acid, with a possibility of liquid air. 4. Electric motors, accumulators, trolley devices, at the side of road. So far the most satisfactory results have been obtained with the steam, oil and electric carriages.

In July 1894, the *Petit Journal*, of Paris, arranged a competition which took place from the 19th to the 22nd; 102 vehicles were entered but at the end of a preliminary test run of 31 miles at a minimum allowable speed of $7\frac{1}{4}$ miles, only 14 petroleum and 7 steam carriages were left for the final run from Paris to Rouen, a distance of 78 miles. All the petroleum and three of the steam wagons completed the run, the winners making an average speed of $10\frac{1}{2}$ miles per hour. This was followed by a race from Paris to Bordeaux and return in which 1 electric, 6 steam and 14 petroleum carriages took part. Nine of these covered the distance in the appointed time, and shared in the prizes. On Oct. 15th, 1895, occurred the Tunbridge Wells competition, organized in London under the direction of Sir David Salomons. This was conducted on a track of about 546 yards in length and like the two previous contests did little to advance the art.

The Chicago-Waukegan race, held on Nov. 21, 1895, under the auspices of the *Chicago Times-Herald*, and repeated on Nov. 28, was productive of good results, for complete records were taken and considerable data obtained.

In September 1896, a race held from Paris to Marseilles and return under the auspices of the Automobile Club of France proved of interest but resulted in little additional information.

A race over a course of 200 miles arranged by the London *Engineer* separated the contestants into four classes: 1. Motor cars for four or more persons, not weighing more than two tons; 2. Carriage for two or three persons, not weighing more than one ton; 3. Carriage for conveying one ton of freight, not weighing more than one ton; 4. Carriage for conveying one ton of freight, not weighing when loaded more than two tons; 5. Car for conveying 500 lbs. of freight, not weighing when loaded more than one ton.

The next trial occurred again in Paris, in February 1897, under the direction of the Automobile Club: It was international in character and intended to encourage the construction of automobiles. Carriages suitable for use upon the streets of Paris were entered, the conditions of the contest being based upon results of tests of the cab service of that city. All competitors were required to make 40 miles in 16 hours allowing two stops, one of half an hour, and one of an hour for breakfast. This run was to be made for twelve consecutive days over twelve different routes selected with reference to gradients. Within the city the speed was limited to 12.4 miles per hour. Each vehicle was required to make the twelve trips with the complement of passengers and baggage called for in its designs or had to carry corresponding.

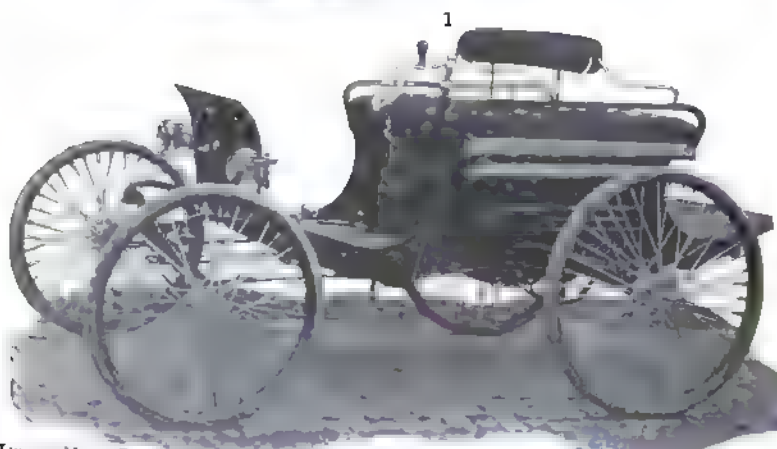
In all 26 motor vehicles entered the race of which 14 were equipped with electric motors and 12 were operated by petroleum distillate engines. As a basis for comparison of cost, the daily expense of running an ordinary Paris cab pulled by a horse was fixed at 19.26 francs (\$3.85). This sum included all expenses, and also the average use of $3\frac{1}{2}$ horses per cab employed.

The first class of vehicles entered covered those with a single motor, where the power is transmitted to motor wheels through an intermediary; with gearing permitting a mechanical variation in speed. Under this head came the Peugeot coupé as a type propelled by a gas-engine and intended to carry three passengers, without baggage, or a useful load of 462 lbs. This vehicle was made up of a closed body, with two seats capable of carrying four passengers, and it did frequently carry this number during the trial. The driver or operator has his seat in front, and controls the apparatus for directing and changing speed and operates a brake-pedal. Attached to this front part is the naphtha reservoir. The motor is placed in the rear of the carriage body. The total weight is 2,838 lbs., with 1,509 lbs. on the front wheels and 1,329 lbs. on the back wheels. The out-to-out width of the vehicle was 5.25 ft., and the total length was 9.18 ft.

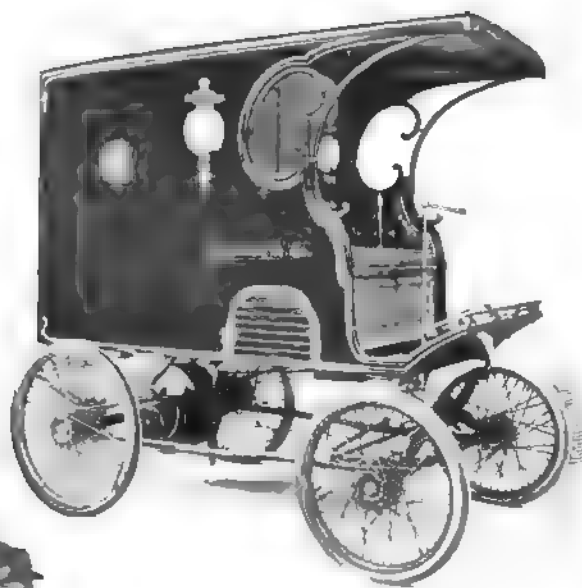
The motor used, with petroleum distillates, was built on the Peugeot system, the charge being exploded by incandescent tubes. It developed 6 horse-power and weighed 231 lbs., with its fly-wheel and bed-plate. The normal revolutions were 680 per minute. The gearing arrangement permits four changes of speed—3.7, 6.2, 9.3 and 12.4 miles per hour, and a backward speed of 9.3 miles.

The average speed made was 14 miles per hour, with 3.7 miles per hour on an 8.2 per cent. grade. The daily cost of running this vehicle was \$5.55; of which sum \$2.17 was for oil, etc., consumed, and \$3.28 was for other expenses.

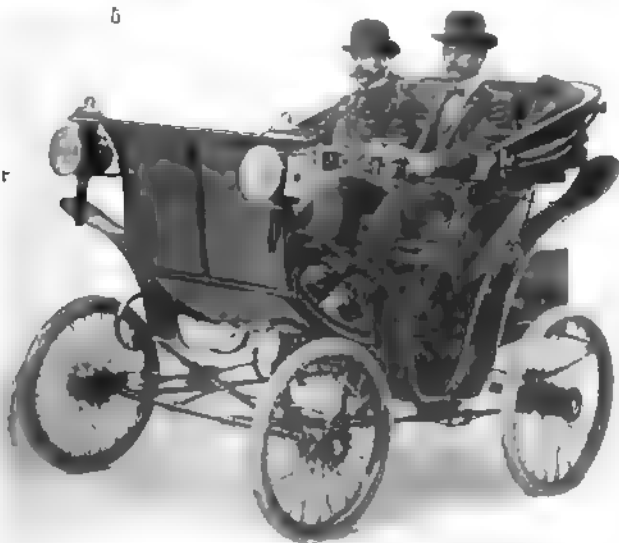
Under the head of electrical motors the Jenatzy coupé is taken as a type. This cab was intended to carry two passengers, or a useful load of 308 lbs. It was made up of the ordinary cab-body with a bracket-seat, though this third seat was not used for a passenger during the trial. The driver sat in front and there handled a directing-bar, speed-variant and brake combined, and under foot was a pedal operating a friction-brake. The total weight was 3,964 lbs.; with 1,854 lbs. on the front wheels. The extreme width of the vehicle was 5.9 ft., and the extreme length 9.2 ft. The motors $4\frac{1}{2}$ horse-power; but it may easily develop, according to the claim of the builder, 10 to 12 effective horse-power. Two normal speeds are arranged for—3.7



MODERN ELECTRIC
trap. 2. Four
motor car
5. PI



5



6 VEHICLES.—1. Two-passenger
passenger trap. 3. Gasoline
car. 4. Delivery wagon.
motor. 6. Victoria.

and 7.4 miles per hour; for the first speed the two batteries are connected in parallel, and for the second speed, in series. Special gearing is provided for passing from 3.7 to 5.6 miles speed, and from 7.4 to 12.4 miles speed, and intermediate speeds can be obtained by introducing momentary resistance coils. The accumulators form two batteries of 22 elements each; each enclosed in a box; one under the driver's seat and one behind the carriage. These two boxes are easily opened for taking out and replacing the batteries.

On the level the batteries in parallel gave an average speed of 5.27 miles per hour; in series they gave a speed of 10.4. On a grade of 8.2 per cent. the batteries in series gave a speed of 4.9 miles per hour. The daily cost of operating the Jenatzy coupé was \$4.05, of which 80 cents was for the repairs to the accumulators and 34.4 cents was for the electricity; the rest went for general expenses.

The second class in the test included vehicles with a single motor, where power is transmitted by motor-wheels by means of invariable gearing, with a differential and chains; and where the variation in speed is secured by a corresponding variation in the speed of the motor. Under this head the electrically propelled Jeantaud cab is taken as a type. This cab is intended to carry two passengers, or a useful load of 308 lbs. Its cost is \$2,800. It is a four-wheeled cab, with the forward wheels carrying a box enclosing the accumulators; the driver is behind, and there controls all movements. The motor and differential gear are under the cab. The total weight of the cab is 3,102 lbs., with 1,419 lbs. over the front wheels. The extreme width of the vehicle is 5.08 ft., and the extreme length is 9.7 ft.

The motor and shaft of the differential are placed in a closed box, with the ends of the differential shaft projecting and carrying pinions for the sprocket chains; this motor, with its transmission gear, weighs 330 lbs., and has a normal power of $3\frac{1}{2}$ to 4 horse-power. Different variations of excitation and the coupling of the batteries permit speeds ranging as follows: 4.34, 7.44, 9.3 and 11.2 miles per hour. Intermediate speeds are obtained by momentary resistances introduced through the pedal of the electric brake. The accumulators contain 44 elements and weigh in all 880 lbs. Transmission is by a sprocket-wheel and chain connecting the ends of the differential-shaft and the corresponding motor-wheel.

The mean maximum speed made in the trial was 10.5 miles per hour; the daily cost of running this cab was fixed at \$3.96.

A Jeantaud landaulet, was also submitted to test, which carried two passengers and cost \$2,800. It weighed 3,652 lbs. Accumulators, weighing in all 1,005 lbs., were used, and the general plan of transmission, etc., was similar to the cab first described. The daily cost of operation was fixed at \$4.04.

The third class of vehicles included those with two motors, one for each motor-wheel; geared directly to it with no provision for change of speed, except by changing the speed of the motor.

To this type belonged the Krieger carriage, arranged so that the body of the carriage could be changed without interfering with the motor mechanism. The coupé and victoria types would carry three or four passengers without baggage; the useful load is 462 lbs., though in the trial they often carried 616 lbs. Either of these carriages could be sold for \$2,400 each.

In these carriages the accumulators are stored in two boxes; one under the seat of the driver, and one behind the body of the carriage. There are two motors, one for each front wheel, and these are both motor and directing wheels, the motors being placed directly over the vertical pivots. The coupé weighs 3,608 lbs.; the victoria 3,498 lbs., and the coupé, with a compartment for baggage, weighs 3,894 lbs.

Each of the two electric motors has a nominal power of 3 horse-power, and weighs about 143 lbs. Varying speeds of from 3 to 12 miles per hour are obtained by means of a series-parallel controller. In the trial, speeds of 5.5, 12.3 and 15.9 miles per hour were made on the level with batteries in series; on a grade of 8.2 per cent. the speed was 3.7 miles per hour in series. The total daily expenses of running the three types of Krieger carriages were fixed at \$4.05 to \$4.06.

In its general conclusions the jury said that one of the most striking features of the trial was the preponderating influence of the cost of repairs to the accumulators and the pneumatic tires, upon the daily expenses of running electric motor-vehicles. The small quantity of electrical energy consumed on this total course of 347 miles, on some of the most crowded streets of Paris, and the small cost of supplying this energy, was one of the surprises to the jury. In the daily expenses for the Jenatzy, Krieger and Jeantaud motor-carriages the specific energy supplied only cost, on the average, 35.4 cents, 34.8 cents and 20 cents respectively. This extremely low cost, seems to render it almost useless to seek for better methods of utilizing the electric motor in propelling vehicles. But while the consumption of energy has so slight an influence upon the daily cost of operation, the enormous general expenses which swell this cost must not be lost sight of. The electric motor must be designed to reduce to a minimum the consumption of energy on streets with steep gradients,

and so regulated and controlled that an inexperienced driver can not communicate to the motor currents disastrous to the accumulators.

As to speed, while this was generally satisfactory, the jury hoped that in another year makers would submit motor-cabs which will better meet the demands of actual cab practice in Paris, and with as small a consumption of energy as possible, meet the following speed conditions:

- 4 miles per hour in seeking passengers.
- 5 miles per hour mounting 5 per cent. grades.
- 7.5 miles per hour on grades from 2.5 to 5 per cent.
- 9.3 miles per hour as an average in ordinary streets.
- 12.4 miles per hour in open and uncrowded streets.

From May 24 to 27, 1898, a series of trials were held at Liverpool, England, under the auspices of the Self-Propelled Traffic Association. This competition was the outcome of an effort on the part of the Liverpool Chamber of Commerce to secure improved methods of transportation between the port of Liverpool and inland towns, also of haulage between the docks and warehouses in the city. In addition the test had the further object of encouraging builders to experiment and construct motor propelled vehicles upon the lines indicated and to provide an opportunity for the public to see something of the progress being made in England. The routes selected were between 30 and 40 miles in length and runs were required to be made on four successive days. It was required that the vehicles be capable of going anywhere that a horse drawn vehicle carrying the same load could go, and further that it be capable of working into or out of an embayment or loading berth $1\frac{1}{2}$ times its own length.

In making the awards the following were taken into consideration:

- (a) Cost: Economy of working including attendants.
- (b) Control: Stopping, starting, changing speed, steering and reversing particularly under adverse conditions, such as on inclines, or in confined spaces;
- (c) Working: Noise, smell, visible vapor, dust or other nuisances when traveling; number of mechanical operations, requiring attention from the driver; efficiency of brakes; time occupied in preparing the vehicle for services on the road; ability to start from rest on an incline of 1 in 16; speed, within legal limits; distance run without taking or receiving supplies of fuel, oil, gas, electrical or chemical materials, or electrical current, water or any agent employed for actuating the motor or assisting its working; ability to complete the course without stopping to effect repairs, adjust parts, apply lubricants, or for any other purpose or cause not provided for in the itinerary; freedom from heat down of any nature.
- (d) Construction: Strength of frame and working parts; quality of workmanship; efficiency of springs; freedom from complicated or over refined parts; facility with which repairs can be effected; capacity of bunkers, oil and water tanks; ratio of available to total platform area; ratio of tare to power of motor; ratio of tare to weight of freight carried during the trials.
- (e) Steam propelled vehicles: Action of feed pumps or injective; ample supply of steam; consumption of fuel and water per mile; leakage of steam or water; arrangements for stoking.
- (f) Oil propelled vehicles: Efficiency of ignition; regularity of carburation and explosions; range and graduation of speed of vehicles, and smoothness with which changes of gear are effected; circulation and weight of cooling water; consumption of oil per mile; leakage of pipes or tanks.

The two circular routes selected were surfaced as follows:

Paved.	Partially Paved.	Macadam.	Total Length.
A: 11.0 miles.	6.4 miles.	18.2 miles.	35.6 miles.
B: 6.6 miles.		29.3 miles.	35.9 miles.

Intermediate depots were established at points about ten miles apart. Loading ballast consisted of small gravel packed in stout bags to weigh 100 pounds. No vehicles propelled by internal combustion engines or electric motors entered the competition.

The vehicles which actually took part in the first competition were as follows:

Steam Lorry to carry two tons, the Liquid Fuel Engineering Co., Ltd., East Cowes; Thornycroft Steam Lorry to carry five tons, The Steam Carriage Wagon Co., Ltd., Cleiswick; a three-ton Steam Lorry by the same company; Leyland Steam Lorry to carry four tons, The Lancashire Steam Motor Co., Leyland.

The accompanying table (Table 1) gives a summary of facts affecting the cost of the motor vehicles in this test:

TABLE I

Summary of facts affecting the costs per net ton mile.

VEHICLE.	PRIME COST.	SPEED--MILES PER HOUR.		Load carried.	Ton miles of load per annum of 260 working days.	Time occupied in obtaining the desired working pressure.	FUEL CONSUMPTION.			WATER CONSUMPTION.		Motive power per ton mile of load.	Attendants per ton mile of load.	THIRTY-FIVE MILES PER DAY.	
		Actual running.	Commercial.				To raise steam.	Per vehicle mile.	Per ton mile of load.	Per vehicle mile.	Per ton mile of load.			Cost of operation per year.	Total cost per net ton.
Lifu 5.34 tons.	Dollars 2620	8.29	7.02	Tons 2.20	40,040	Minutes 20	Gals. 1.0	Gals. 0.655	Gals. 0.298	Gals. 4.54	Gals. 2.06	Cents 2.44	1.10	Dollars 2165	Cents 10.38
Thornycroft 9.55 tons.	3750	3.41	2.79	4.73	34,434	23	Lbs. 65	19.07	Lbs. 4.03	9.11	1.93	0.72	1.82	2765	6.18
Thornycroft 6.16 tons.	3150	5.98	5.22	2.53	34,206	21	Lbs. 64	9.20	Lbs. 3.64	3.69	1.46	0.64	1.82	2235	9.32
Leyland 7.43 tons.	1775	5.25	4.45	4.06	46,446	22	Gals. 0.75	Gals. 0.528	Gals. 0.130	3.41	0.84	1.06	0.94	1835	4.78

Ton miles = Load carried X Distance traversed.
Commercial speed = In speed to be expected in regular operation does not include delays due to special conditions.

The results of this trial indicate that a steam vehicle weighing from 5 to 9 tons including load of from 2.20 to 4.73 tons can be built for from \$1,800 to \$3,700, to run at a commercial speed of from 3 to 7 miles per hour for 35 miles per day at a total cost of from 4.80 to 10.50 cents per net ton per mile, or it will cost from \$1,850 to \$2,800 per year.

On Nov. 9, 1898, a motor vehicle competition was held in Boston, Mass., under the auspices of the Mechanics' Institute Fair, the results of this were of small importance and afforded little additional information.

During the year the Electric Vehicle Co., of New York City, placed in service 85 electric hansom cabs and broughams, which have been in constant operation with marked success. These have four 36-inch wheels provided with 5-inch rubber tires and weigh when complete 2,700 pounds. The steering is done by shifting a vertical lever, conveniently placed at the right hand side of the operator's seat, which in turn through a system of levers shifts the rear wheels.

The two motors are controlled by a small parallel controller placed under the cabman's seat, and are also operated by a lever at the left side of the seat. Two iron-clad self-oiling ball-bearing Lundell motors are mounted under the cab body upon the axle with a form of spring suspension. Each motor weighs 172½ pounds and is rated at 1½ horse power, with a speed of 1,350 revolutions per minute, taking current at from 88 to 120 volts.

The small pinions on the motor shafts mesh into gears with a reduction ratio of 8½ to 1, mounted upon each driving wheel. Current for operating the motor is supplied by 48 accumulator cells in a wooden box placed under the operator's seat. These weigh between 1,200 and 1,500 pounds. The battery has a capacity sufficient to run the cab 20 to 25 miles on an average. The controller provides three speeds; 4 to 5 miles at which rate the vehicle can run 25 miles; 7 to 9 miles, with a travel of 20 miles, and 15 miles with a travel of 13 miles. The complete cab costs about \$2,500, of which \$400 is chargeable to the battery. For service the usual city rate was at first charged; this has since been reduced to \$1 per hour or 30 cents per mile.

AUTO-TRUCK. See AUTOMOBILES.

AVELING, DR. EDWARD BIBBINS, British scientist and advocate of socialism, and son-in-law of the German socialist Karl Marx, died August 4, 1898. He was born of Irish parentage at Stoke-Newington, November 29, 1851. He held professorships in the departments of chemistry, physiology, and comparative anatomy in New College, Cambridge, and the London Hospital. Besides translating foreign works on socialism into English, Dr. Aveling wrote much to effect a wider and more definite popular knowledge of the works of Darwin and Marx. Mrs. Aveling (Eleanor Marx), known as a writer and speaker, committed suicide in May, 1898.

AZORES. A cluster of islands in the Atlantic ocean belonging to the kingdom of Portugal and having an area estimated at 1,005 sq. m., with a population in 1890 of 255,594. The chief town is Ponta Delgada in the island of San Miguel, with a population of 16,769, but the usual residence of the governor is at Angra, in the island of Terceira (pop. 11,067). The islands constitute a province of the kingdom of Portugal, returning deputies in proportion to the population.

AZTEC CLUB, founded in the City of Mexico in 1847, by officers of the U. S. army, with a view to cherishing the memories and keeping alive the traditions that cluster about the names of those officers who took part in the Mexican War. Associate members, sons or relatives, of the original members are nominated by them and will inherit the membership. President and Treasurer, Gen. Simon B. Buckner, Kentucky; Secretary, Gen. Horatio G. Gibson. Headquarters, Washington, D. C. Membership, 245.

BABYLONIA. See ARCHÆOLOGY (paragraph Babylonia).

BACCHYLIDES. Until the end of 1897, Bacchylides was little more than the name of the youngest of the nine poets whom the Alexandrian scholars reckoned the masters of Greek lyric verse. Born near the end of the sixth century on the island of Keos, a nephew of Simonides, a somewhat younger contemporary and rival of Pindar, praised for his grace and sweetness by the ancient critics, he yet passed so completely out of sight that only 107 verses were known from quotations, and these in such fragmentary form that the longest passage contained only twelve lines. Recently, however, there arrived at the British Museum from Egypt about two hundred fragments of a papyrus roll, which was recognized from the presence of lines already known as a portion of the works of the lost poet. As pieced together the roll measures 14 feet 9 inches, and contains 37 columns of writing, but its original length can hardly have been less than 17 feet, and may well have been much greater. It contains twenty poems of which six are practically complete, while of nine more a considerable portion has been preserved. In all 1,070 lines can be restored with certainty. Six poems are unique in Greek literature, and may be classed in general as hymns, though it is probable that among them are specimens of the pæan and dithyramb. The other fourteen are in honor of victors in the national games, in-

cluding three for Hiero of Syracuse. Two of the poems for Hiero and one for Pythias of Ægina celebrate victories for which Pindar also composed odes. As in Pindar all the longer poems contain some legend often but loosely connected with the main theme, and it is interesting to find that within eighty years of his fall the story of Croesus could be used to point a moral. One of the hymns contains the story of the descent of Theseus into the depths of the sea to prove his sonship to Poseidon, a legend hitherto unknown in literature, though preserved by Greek vase-painters. As a poet Bacchylides does not belie the statements of his ancient critics. Without the force and brilliancy of Pindar, he still shows genuine artistic power though restrained by the more conventional rules of his art. A true poet, if not a great poet, and a real addition to the world's literature, is the substance of the judgment pronounced by his first editor, Mr. Kenyon.

BACILLUS BOTULISMUS. A new bacillus has been discovered by E. van Ermengem, which, from being found in unboiled ham that had caused botulismus, or sausage poisoning, its discoverer has named the *Bacillus botulismus*. The ham had caused poisoning in 14 persons, all of whom were dangerously ill and 3 of whom died. A solution made by rubbing in water a piece of the ham was fed to rats, cats and mice without immediately fatal results, but proved rapidly fatal to guinea pigs and apes, even in small doses. Cats died in a few days. The poison proved as effective when the solution was filtered free of germs, showing that it is a toxin. When kept free from light and air it lasted in an active state many months. Warmth decomposed it rapidly. Microscopic examination showed many spores scattered through the meat, which proved to be those of a bacillus easily isolated in anaërobic cultures. The *Bacillus botulismus* is rod-shaped with spore formation at the end, resembling the Tetanus bacillus. As a rule it does not increase in the human body (though found in the spleen of one of the three patients who died) owing to the fact that it does not grow well in a temperature over 35 C. It has not been found in any quantity in experiments on animals. Van Ermengem reached the same results from experiments with a pure culture of the *Bacillus botulismus*, as with this ham and water solution. He is of the opinion that some of the reported cases of poisoning from flesh and from preserves may be due to this same bacillus. See *Zeitschrift für Hygiene u. Infektionskrankheiten*.

BACILLUS PRODIGIOSUS. See LEPROSY and SERUM THERAPY.

BACTERIOLOGY. See BACILLUS BOTULISMUS; DIPHTHERIA; EPIDEMIC INFLUENZA; HEATSTROKE; INDIA paragraph Plague; LEPROSY; SERUM THERAPY; SLEEPING SICKNESS; TUBERCULOSIS; TYPHOID FEVER; YELLOW FEVER.

BADEN, GRAND DUCHY OF. *Population, Religion, Education.*—The census of 1895 gave Baden a population of 1,725,464, an increase of 67,597 over the returns for the year 1890. The larger proportion of the population, namely 54.7 per cent., lived in communities with less than 2,000 inhabitants. The returns of the same census (1895) showed that about two-thirds of the population were Catholic. There were 1,057,417 Catholics, 635,392 Protestants, 6,592 of other Christian sects and 25,903 Jews. In the year 1894-5 there were in the public schools, gymnasia, and universities, 348,211 students and pupils.

Finance.—The expenditure according to the budget estimates for the year 1897 was 87,520,764 marks, and the revenue 81,506,803 marks. In 1897 Baden had no general debt but its debt on the railways was 335,172,885 marks. At the beginning of 1896 there were 1,024 miles of railway in the country, of which 871 belonged to the government.

Government.—The executive authority is vested in the grand duke, the title being hereditary in the eldest male line. Legislative authority is exercised by a parliament consisting of two chambers, namely the Upper Chamber which comprises the princes of the grand ducal house, and representatives of the nobility; the Lower Chamber, which consists of 63 representatives chosen for four years, twenty for the cities and 43 for the country districts. The reigning grand duke is Frederick I, who after a regency of four years assumed the title on September 5, 1856. His wife is the daughter of the Emperor William I of Prussia.

BADEN-POWELL, SIR GEORGE SMYTH, K. C. M. G., M. A., LL. D., F. R. S., a Member of Parliament, political economist, and authority on colonial affairs, died November 20, 1898. He was born in Oxford, England, December 24, 1847, and educated at St. Paul's, Marlborough, and at Balliol, Oxford. During the first year of his course in Balliol he published *New Homes for the Old Country*. In 1880 he went to the West Indies to investigate the results of the sugar bounty system, and two years later Mr. Gladstone appointed him a "joint special commissioner to report upon the administration revenues and expenditures of Great Britain's colonies in the West Indies." This report was considered to be a complete summary of West Indian affairs. He went to South Africa in 1885. It was here that he gained a reputation as an authority on colonial policy. In 1891 he served on the commission appointed to

investigate the Behring seal question and was a member of the joint commission that deliberated in Washington. He was a Conservative member of the House of Commons and represented the Kirkdale division of Liverpool from 1885 to the time of his death. He wrote extensively on subjects of colonial, financial, and scientific interest, *Absorption of Small States by Large, etc.*

BAHR-EL-GHAZAL, a Soudanese province belonging to Egypt until cut off from the latter's jurisdiction by the Mahdi's rebellion. It is watered by the affluents of Bahr-el-Ghazal and Bahr-el-Arab. It is a rich country, producing ivory, gum, rubber, and other products, and having, it is said, an abundance of timber. The natives are largely Zandebs, not negroes, but a copper-colored race with an occasional fair-haired type. Their origin is uncertain. They are said by a recent observer to be remarkable for their intelligence, trustworthiness, and self-respect. The province was controlled by Arabs until 1879 when Gordon established a government there on behalf of Egypt. The Mahdi's revolt cut off every communication with Egypt and in spite of the resistance of its administrator, Lupton Bey, it fell into the hands of the Mahdists. Attention was drawn to it in 1898 on account of the conflicting claims of France and England. It is a possession of great importance to the country that acquires it, for its population, which was estimated by Dr. Junker in 1883 at 1,500,000, is placed by a recent Belgian estimate at 2,000,000, and, owing to the fertility of the country as well as to the character of its inhabitants, its revenues are likely to be important and it affords a fine recruiting ground in the event of war. It lies to the east of the Ubangi district which belongs to France, and Major Marchand passed through it on his journey to Fashoda in March, 1898. It was said that France desired it as a recruiting ground for a native army in Central Africa and that from it as a base she would be able to command the upper Nile and ultimately Egypt. One of the grounds of the English claim was the belief that Egyptian sovereignty had never lapsed over this region. See the article EGYPT.

BALIZE. See BRITISH HONDURAS.

BALL, Rt. Hon. JOHN THOMAS, LL. D., D. C. L. (Oxon.), Lord Chancellor of Ireland, died March 17, 1898. He was born in Ireland in 1815, and was educated at Trinity College, Dublin. He became an Irish barrister in 1840 and Queen's Counsel in 1854. He was Vicar-General of the province of Armagh (1862); Queen's Advocate (1865); Solicitor-General for Ireland (1868); Attorney-General for Ireland (1868, 1874, 1875); Member of Parliament for Dublin University (1868-75); Lord-Chancellor of Ireland (1875-80). He published *The Reformed Church of Ireland and Historical Review of Legislative Systems in Ireland*.

BALKAN PENINSULA. The following table gives the area and estimated population of the different parts of the Balkan peninsula from the most recent statistics available in 1898:

	Area Sq. miles.	Population.
Immediate possessions of Turkey in Europe.....	62,744	5,711,000
Bulgaria (tributary principality).....	24,360	3,309,816
Eastern Roumelia (autonomous province).....	13,500	992,386
Novi-Bazar } Bosnia } Herzegovina }	23,577	1,568,092
Total Turkey in Europe.....	124,181	11,581,294
Servia (kingdom).....	19,050	2,314,153
Montenegro (principality).....	3,630	228,000
Total Balkan peninsula.....	146,861	14,123,447

See TURKEY, and the articles on the separate states.

BALTIMORE. The new charter secured by the city of Baltimore in 1898 resembles in many points the charter of Greater New York. The executive officer is the mayor whose term is four years, and who appoints all the principal officers, with the exception of one or two who are to be elected; but his appointments must be confirmed by the upper house of the city council. He has the power of removal. The city council consists of two houses, the members of the upper house holding office for four years, and the lower house for two years. The provision in the old charter that members of the upper house must own property assessed at \$500, and those of the lower house property assessed at \$300 is retained in a new instrument. The members of the allied departments constitute a joint board having advisory functions. A board of estimates almost exactly the same as that in Greater New York is established and the rules for the granting of franchises are modelled on those of New

York, but franchises are limited to twenty-five years instead of fifty years, as in New York, although the franchises may be renewed upon revaluation for another twenty-five years.

BALUCHISTAN, a country in the southern part of Central Asia with an estimated area of 130,000 sq. m., and an estimated population of 500,000. It includes Baluchistan proper, which is independent, being a confederation under the control of the Khan of Khelat; the districts of Quetta and Bolan, each administered by British officials acting for the Khan; seven assigned districts known as British Baluchistan and directly under British control; and finally certain territories belonging to Afghan or Baluch tribes. The capital is Khelat, but the chief city is Quetta. Owing to the uncertainty of the rainfall the country is not very productive. Camel grazing is an important occupation. Among the exports are wool, hides, madder, fruit and tobacco. Coal occurs in places. The Khan of Khelat receives a subsidy from the Indian government. In 1898 the Khan was Mir Mahmoud.

BALZAC, BODIN'S BUST OF. See SCULPTURE (paragraph Exhibitions).

BANGKOK. See SIAM.

BANFFY, BARON DESIDERIUS, Premier of Hungary, was born at Klausenburg, Hungary, in 1842. He was educated at the universities of Leipsic and Berlin. After leaving the latter university he travelled and then became an official in the Transylvanian Administration, and in 1875 became provincial prefect in Transylvania, where he was active in extending the spirit of Hungarian nationality. After service in the lower house he was elected, upon the reformation of the upper chamber, a life peer, and in 1892 was made President of the *Reichstag*; on the retirement of Dr. Wekerle in 1895, he was appointed Premier. Baron Banffy, who is a strong Liberal, assumed his present position with the understanding that Dr. Wekerle's policy should be carried out. In 1895 his dispute with Count Kalnoky brought about the latter's resignation, but the baron's attitude had the popular approval, as was seen from the general election in October, 1896. Late in November, 1898, it was announced that Banffy favored the continuation of the *status quo* in the lower house; the controversies ensuing precipitated numerous duels, no less than six arising from the action of M. Horansky, who called Banffy "a cheat and a traitor." In the duel between Horansky and the Premier, neither was injured.

BANK—BANKING. The efforts to secure a better system of banking in the United States continued during the year 1898 to be an important part of the currency reform movement. These efforts took shape in several important proposals in regard to the national banks as set forth by the Monetary Commission which grew out of the Indianapolis convention of 1896, by the Hon. Lyman J. Gage, Secretary of the Treasury, by Congressmen Walker and Fowler, and by President McKinley in his annual message of December 1897. For an account of the currency reform movement in general, and the details of some of the proposals that were made for the improvement of the national banking system, see the article CURRENCY REFORM. The various suggestions for reforming the currency, and in particular for devising a new banking system, were laid before the Committee on Banking and Currency in the House of Representatives, and this committee after deliberation prepared a measure which was proposed by Congressman McCleary on June 13, 1898, and known as the McCleary Bill. Its main provisions are discussed in the article on Currency Reform, but it is important to consider here some of the statements contained in the accompanying report. This report was one of the most notable documents in the recent literature on the currency question. The portion of it which relates to banking has an especial value and it may be of interest to summarize here some of its statements.

In the first place, it traces the historical development of banking and shows in an elementary way the social utility of the functions which the banks perform. Of these functions the most important is the extension of credit whereby the industrious and prudent members of society find means to anticipate their product and thus to carry on the work of production to a far greater extent than would be possible under other conditions. A bank is able to supply a credit basis for production by lending money to men known to be honest and capable and thus give them the means of employing a vast number of persons and of producing a great quantity of useful goods. The enormous extent to which production rests upon credit under present industrial conditions is too well known to need explanation. In so far as banks fulfil this office they perform one of the most necessary duties which justify their existence. The note-issuing function is less important in its influence upon production. Still, as a means of supplying a sound and elastic currency its value is unquestionable. The following figures show the relative importance of the different kinds of currency in performing the money work required to be done in the United States. The total volume of our circulation on January 1, 1898, was:

Gold coin and certificates.....	\$584,126,049
Silver coin and certificates.....	503,906,973
Government and demand notes.....	409,239,863
	<hr/>
National bank-notes.....	\$1,497,272,885
Deposits subject to check.....	\$223,827,755
	<hr/>
Total bank currency	\$3,434,563,513

From this it will appear that a far greater portion of the monetary transactions of the country are discharged by means of checks and that the sum of national bank-notes and the deposits subject to check is more than double the amount of the government currency. An attempt was made by the Comptroller of the Currency in 1896 to show the relative extent to which checks and the other forms of currency discharged performed the money function. He found that for every \$100 worth of business transacted through the banks the different forms of money were issued in the following proportions: gold 60c., silver 50c., greenbacks, silver certificates, treasury notes and national bank-notes \$6.30, bank checks, drafts, etc. \$92.50. This is enough to show the vast importance of the office which checks perform in the monetary work of the community, and besides the enormous saving of currency exchanges which they effect there is the vast work performed by the clearing houses, whose returns show that through them an exchange of property valued at \$50,000,000,000 is each year effected. In this estimate checks which do not pass through the clearing house are not counted and these are placed at some \$20,000,000,000 a year.

At first thoughts it appears a matter of surprise that the government should regulate the issue of bank-notes and at the same time allow checks to be issued without restriction. For the bank-note is after all of the same general character as a check. Each represents a demand obligation of the bank. Yet while the law puts no limit on the extent to which a bank may incur obligations through checks it does restrict the incurrence of such obligation through bank-notes. The explanation of this is the fact that the acceptance of a check implies a personal knowledge of the drawer. Within a certain circle checks may serve as well as and even better than bank-notes, but this circle is restricted to those who know something of each other's character and standing. Among these persons the interchange of checks is safer than the interchange of bank-notes on account of the ease of transmitting large amounts and the lesser liability to loss through misappropriation. But in dealing with strangers, checks are often useless. A more generally accepted currency is here needed and it has been found by experience that when subject to certain restrictions the banks can supply such a currency.

Why are these restrictions needed, it may be asked. The government does not limit the right of any one to circulate any number of personal notes that he chooses nor does it restrain a number of persons from uniting in the issuance of such notes and in circulating them as widely as they can. Why then should the government regulate the bank-note issues? The person who accepts them does so voluntarily. The answer is to be found in experience. Banks in certain circumstances have supplied a credit currency in response to the needs of trade and they have done this with perfect safety and with good results, effecting thereby a great saving to the community, both in convenience and in the amount of specie needed to carry on exchange. At the same time it has been observed that this useful function of the banks has been impaired under a system of free banking by the uncertainty of the individual as to the financial status of the bank—an uncertainty arising from the different degrees of honesty or efficiency with which the affairs of different banks have been managed. Under free banking, as it existed in the fifties, the condition of the bank currency was chaotic. A man who accepted a bank-note without previous knowledge of the financial status of the bank, did so at his peril. He was obliged in his own defense to watch the weekly and the daily bulletins showing the rating of all those banks whose currency was likely to fall into his hands in the course of trade. An element of speculation entered into the every day transactions of merchants who conducted their business by means of such a currency as this, and if there is one fact established by economics, it is that the undue dominance of luck or chance in business is to be deplored.

In view of these results of unregulated banking, it was proposed that by adopting some reasonable and consistent system the government should allow banks to perform the note-issuing function and at the same time prevent the bad results which arose from an abuse of the privilege. In other words, it was recognized that bank-notes supplied a social need, but it was thought that by means of government regulation they could be better adapted to their purposes. As the former Secretary of the Treasury, Charles S. Fairchild, said before the Committee on Banking and Cur-

rency, "Therefore the government properly came in and devised a system by which they shall be issued, and then certified that they are issued under that system. So that a man who takes a note, if he knows how good the system is, can know how good the note is, and he does not have to stop and look further. He has to know one large thing instead of a vast number of smaller things."

The interference of the government in this matter rests upon the same ground as its assumption of the exclusive right of coinage. Banks could issue notes without government regulation and the acceptance or rejection of these notes could be left to the judgment of the individual. This has been tried. In the same way the owner of bullion could place on it his individual stamp, stating its weight and fineness, and then circulate it as currency in the community, whose individual members would have to determine for themselves the question of its actual value. This too has been tried. But in the one case as in the other experience has shown that uniformity and system will save more to the community by removing doubt and by promoting rapid exchange than will be lost through the expense of government supervision. The object of government supervision then is to do a service to the whole community by diminishing the amount of bullion and the number of bank-notes that are necessary to do its money work. By making the instruments of exchange better fitted for their office, it increases the rapidity of their circulation and thus diminishes the volume necessary to meet the demands of business.

These are some of the points of a general character brought up in the Committee's report which accompanied the currency measure. One of the special objects of this measure being to improve the existing banking system, the report contains a summary of the merits and defects of the national banks as at present constituted. This summary is a very clear and compact presentation of the main arguments which are urged by the advocates of this particular branch of currency reform. Of all that can be said in favor of our national banking system the most significant thing is this: Under it no one has ever lost a single dollar by having in his possession a national bank-note. These notes rest on perfect security and as a consequence are unhesitatingly accepted from one end of our country to the other. When this system is contrasted with the system of State banks as it existed before the war, the great significance of these facts is apparent. The notes issued by the State banks wholly lacked that uniformity and security which characterize the present system. The note issues of those banks varied widely in their character; some were good and others were worthless, according to the banking system that existed in the respective States. Now the notes of one bank are as good as those of another and this has been accomplished without granting a monopoly of the note-issuing power to any set of banks. A national bank may be organized in any part of the United States by any number of persons, not less than five, provided they gather capital to the amount of \$100,000 and in case of small towns of 6,000 inhabitants of \$50,000, and provided they satisfy the Comptroller of the Currency that they are fit persons to be intrusted with this privilege.

Now for the defects. As a condition precedent to its transaction of business a bank must purchase United States bonds to the value of 25 per cent. of its capital and deposit them with the United States Treasurer at Washington, whereupon it may receive an amount of notes equal to 90 per cent. of the par value of the bonds and not exceeding 90 per cent. of the capital of the bank. Besides this each national bank must maintain in the treasury for the redemption of its notes a fund in lawful money equal to 5 per cent. of its circulation. Thus the basis of note issues is the credit of the government. So far as one essential requirement is concerned, namely security, it is fully met by this system. It remains to be seen how far another requirement of any banking system is fulfilled. This is the requirement of elasticity or the responsive adaptation of bank currency to the needs of trade. The extent to which a bank may profit by issuing notes under this system at a time when government credit is high and bonds are selling at a premium can be seen by this illustration offered in the Committee's report: Supposing the market price of United States bonds bearing 4 per cent. interest is 120, a bank investing \$120,000 can purchase \$100,000 of these bonds, on the deposit of which with the United States treasury it can issue \$90,000 in circulating notes, that is, 90 per cent. of the face value of the bonds. The bank would also have to lay out \$4,500 in accordance with the requirement that it shall keep in the treasury a fund for the redemption of its notes equal to 5 per cent. of its circulation. Thus the bank would have at its disposal only the sum of \$85,500, although it had expended the sum of \$120,000. Its profits consist of the interest on the government bonds and of the interest on this \$85,500 of notes. It will be seen from this that if the current rate of interest in the money market is comparatively high it may be more profitable to the bank to invest its capital in other ways; although when the current rate of interest in the market is low, approximating that on government bonds, there may be a reasonable profit to the bank in the issuance of notes. If this is so, we should expect to see a comparatively large issue where the supply of loanable capital is considerable,

that is, where the interest is low, and on the other hand small issues where capital is in demand, namely where interest is high. This appears to be actually the case as a result of investigation made by the Comptroller of the Currency for the year 1897. Taking three typical New England States, he found that the minimum circulation of the 132 banks was \$3,650,625 and the actual circulation was \$10,036,585. In three Western States with 264 national banks, the amount of circulation that could be issued on the minimum deposits of government bonds was \$4,681,597, while the actual circulation was only \$5,518,237. In six Southern States with 102 national banks, the minimum circulation was \$2,273,400, while the actual circulation was \$2,568,317. Thus where there was an abundance of capital, as in the New England States, the circulation was nearly three times the required minimum, while in localities where capital was in demand there was a comparatively slight excess of the actual note issues over the minimum required. This is certainly a sign that the banks do not satisfactorily issue notes in response to the needs of the trade.

Another argument urged against the present banking system is that it does not supply notes in response to seasonal demands, and as an instance, it is cited that in the agricultural communities of the Southern and Western States the banks are utterly unable to meet the extraordinary demand for currency during the three or four months in which the crop is being removed. The crops, therefore, do not supply the means for their own transportation. The purchasers are obliged to go to the money centres to borrow funds and the competition brings up the rate of interest. It is also said that the bank-notes do not readily respond to emergency demands, and as an illustration of this the case of the New York banks in the summer of 1893 is cited. Their reserves sank to a point below the legal minimum during the period of stringency and at the same time the bank-note issues increased only about \$5,000,000. When the panic was over and there was a comparative abundance of currency, the bank-notes began to expand and in the succeeding autumn showed an excess of about \$32,000,000 over the amount in circulation on June 1. These are some of the evils which are said to be inherent in a bond-based currency like that issued by the national banks—a currency of which the state of the government credit rather than the condition of trade determines the amount. As an illustration of the way in which the volume of notes has altered with changes in the credit of the government, it may be said that after the close of the war when government credit was firmly established the amount of the bank-note circulation began to shrink, and that it fell from \$339,081,799 in 1873 to \$122,928,085 in 1890.

In view of these defects the Committee and other monetary reformers have set themselves the difficult task of remodelling the present system in such a way that the notes shall remain as perfectly secured and as universally accepted as at present, but that they shall at the same time be issued more readily in response to the general needs of trade, to local conditions, to seasonal demands, and to emergency demands. The various schemes which have been proposed for this purpose are discussed in a general way under Currency Reform (q. v.).

The amount of national bank-notes in circulation has considerably increased since the summer of 1893. On June 1, 1893, the total national bank-notes outstanding numbered 177,164,255. At the end of 1896 they numbered 235,398,890. During the next year they showed some slight decrease and this gradual decrease continued during the early part of the year 1898; but from April, 1898, when they amounted to 224,398,019, they gradually increased and on October 1, 1898, amounted to 235,356,950.

The following table from the report of the Comptroller of the Currency in 1898 shows the assets and liabilities of national banks and other banking institutions in the United States on July 14, 1898:

Items.	3,582 national banks.	5,903 other banks.	9,485 total banks.
Loans	\$2,151,757,655	\$2,480,874,360	\$4,632,632,015
United States bonds	285,356,900	179,328,943	464,685,843
Other bonds	250,689,375	1,125,561,379	1,376,250,754
Cash	492,882,724	194,913,450	687,796,174
Capital	622,016,745	370,073,788	992,090,533
Surplus and profits	332,971,643	399,766,497	732,738,140
Deposits	2,076,226,576	3,664,797,296	5,741,023,872
Total resources	3,977,675,445	4,631,328,357	8,609,003,802

For further statistics of the national banks in the United States, see the article UNITED STATES (paragraph National Banks).

BAPTISTS stand third in the U. S. with regard to numbers. I. and II. Regular (North and South), with 17,165 ministers, 28,935 churches, and 2,324,170 members; III. Colored 1,731,636 members; IV. Six Principle, with 14 ministers, 18 churches, and 937 members; V. Seventh Day, with 130 ministers, 111 churches, and

9,154 members; VI. Freewill, with 1,350 ministers, 1,571 churches, and 91,981 members; VII. Original Freewill, with 120 ministers, 167 churches, and 12,000 members; VIII. General, with 550 ministers, 575 churches, and 28,000 members; IX. Separate, with 91 ministers, 91 churches, and 6,235 members; X. United, with 25 ministers, 204 churches, and 13,209 members; XI. Baptist Church of Christ, with 80 ministers, 152 churches, and 8,254 members; XII. Primitive, with 2,130 ministers, 3,530 churches, and 126,000 members; and XIII. Old Two-Seed in the Spirit Predestinarian, with 300 ministers, 473 churches, and 12,851 members. In 1898 the total number of Baptists in the United States was 4,364,427. At the conference in Washington, D. C., November 23, 1898, the American Baptist Home Mission Society decided to evangelize in Cuba, Porto Rico, and possibly Hawaii, as did also the Southern Board. The American Baptist Publication Society will coöperate with both. Another new enterprise was the founding of an industrial school at Ongole in India, by Rev. J. E. Clough. The reception of Dr. W. N. Clarke's treatise on theology, published this year, and the meeting of the Baptist Congress in Buffalo in October, when many questions were discussed, seem to point to more liberal beliefs in the Baptist church. Colgate elected a President, Dr. George Merrill, of Newton, Mass., but the University of Rochester, Brown and the Southern Baptist Theological Seminary were at the close of 1898 still without presidents. The latest report of the Commissioner of Education shows the Baptists to have 51 institutions, with 713 professors, 6,939 students, and an endowment fund of \$13,611,224. The Free Baptists, or Freewill Baptists, also report progress. Their most notable event was the 30th triennial general conference at Ocean Park, Me. Missions was the chief subject discussed; and the Free Baptist Young People decided to send a missionary to Africa and to support two missionaries in India. The question of the Free Baptists of Nova Scotia and New Brunswick consolidating with the Free Baptists of Maine, was agitated. The theological institutions—Bates College, the New Hampton Institution, and the Ministers' Institute at Cobb Divinity School—report prosperity.

The Colored Baptists held a national convention at Kansas City, Mo., in September, 1898, in a church, recently completed at a cost of \$30,000. The value of their church property amounts to \$9,619,373. The contributions in 1898 were \$786,533, for church expenses, and \$111,995, for other purposes. Very great results were reported of the National Baptist Publishing Board at Nashville, Tenn., which published and handled 1,573,750 copies of periodicals and did \$19,426 worth of business. It aided mission stations in Africa. The foreign missionary work of the Colored Baptists shows a large increase. This year a mission was started in Cuba. The Western College at Macon, Mo., managed and supported by Colored Baptists, reported prosperity. There are 39 such institutions. The *National Baptist Magazine* was transformed from a quarterly to a monthly.

BAPTISTS, GERMAN. See DUNKARDS.

BAPTIST YOUNG PEOPLE'S UNION OF AMERICA, organized in 1891, represents all the Young People's Societies of the Baptist Churches in America and Canada. It holds annual meetings. Officers at the close of 1898: President, John H. Chapman, Chicago, Ill.; Vice-Presidents, R. H. Pitt, D. D., Richmond, Va., H. O. Rowlands, D. D., Lincoln, Neb., and A. E. Wall, Moncton, N. B.; Secretaries, Rev. E. E. Chivers, D. D.; Chicago, and Rev. H. W. Reed, La Crosse, Wis.; and Treasurer, Frank Moody, Milwaukee, Wis. Membership 225,000.

BARBADOES, the most easterly of the Caribbee Islands, is a British colony having an area of about 166 square miles (106,470 acres) and a population in 1896 of about 189,000. The principal town and capital is Bridgetown (pop. 21,000). The colony is administered by a governor, who in 1898 was Sir James Shaw Hay, K. C. M. G. He is assisted by an executive council and committee, a legislative council of nine members, and an assembly of twenty-four members, elected each year by popular vote. There are seven police magistrates and a Supreme Court. The island is the headquarters for European troops in the West Indies. About 100,000 acres are under cultivation and the staple product is sugar, there being 30,000 acres planted with it, and 441 sugar works, and 12 rum distilleries. The sugar yield has been, in 1894, 66,262 hhds.; 1895, 36,461 hhds.; 1896, 49,399 hhds. Manjak is exported. About 900 persons are engaged in fishing, the value of the annual catch being about \$82,800. The registered shipping of 1896 amounted to 7,814 tons net. There are twenty-four miles of railway and 470 miles of wagon roads in the island. There are private telephone lines of 600 miles and a telegraph line of twenty-four miles. Both the telegraph and the railway are subsidized by the government, the latter \$29,200 annually. The Colonial Savings Bank has a paid up capital of \$2,922,000.

BARBER SHOPS are believed to be the frequent means of spreading diseases from customer to customer, notably syphilis and other diseases of the skin and scalp. The Board of Health of the Province of Quebec, at a meeting held June 17, 1898, approved instructions for the hygiene of barber shops, the principal points of

which are as follows: Each regular customer should have his own razor, soap, brush and comb. Instruments used in common should be disinfected by the barber after being used. Powder puffs should be replaced by a ball of cotton wool and alum sticks by small alum tablets, each to be thrown away or destroyed immediately after using. Sponges should never be employed, and if a common vaseline pot is used the vaseline should be removed by a spatula and care taken not to let this come directly in contact with the hands of the barber. The barber should carefully wash his hands and cleanse his finger nails before passing from one customer to another.

BARING-GOULD, SABINE, English author and clergyman, born in Exeter, January 28, 1834. On the death of his father he inherited the family estate of 3,000 acres. His list of publications is enormous, including essays, sermons, and novels. His last novel is *Domitia* (1898). In 1898 his opera *The Red Spider* was performed.

BARLEY. The following table published by the Department of Agriculture shows the acreage, production and value of barley in the United States, in 1898:

States and Territories.	Acres.	Production. Bushels.	Value.
Maine	12,109	326,943	\$183,088
New Hampshire.....	4,915	115,502	66,991
Vermont	17,739	532,170	250,120
Massachusetts	1,712	41,944	27,683
Rhode Island	318	8,904	5,431
Connecticut .....	.....	.....	.....
New York	172,299	4,341,935	2,084,129
New Jersey .....	.....	.....	.....
Pennsylvania	8,829	171,283	75,365
Delaware .....	.....	.....	.....
Maryland .....	.....	.....	.....
Virginia .....	.....	.....	.....
North Carolina .....	.....	.....	.....
South Carolina .....	.....	.....	.....
Georgia .....	.....	.....	.....
Florida .....	.....	.....	.....
Alabama .....	.....	.....	.....
Mississippi .....	.....	.....	.....
Louisiana.....	.....	.....	.....
Texas	2,074	41,480	20,740
Arkansas .....	.....	.....	.....
Tennessee	1,934	34,812	19,495
West Virginia .....	.....	.....	.....
Kentucky	1,395	22,320	8,928
Ohio	21,768	624,742	274,886
Michigan	41,539	1,046,783	460,585
Indiana	4,460	104,364	45,920
Illinois	12,866	351,242	136,984
Wisconsin	258,268	7,515,599	3,006,240
Minnesota	322,540	9,160,136	3,022,845
Iowa	351,270	9,133,020	3,105,227
Missouri	791	15,820	5,695
Kansas	26,280	735,840	198,677
Nebraska	40,307	1,092,320	273,080
South Dakota	108,039	2,484,897	670,922
North Dakota	198,968	5,252,755	1,523,299
Montana	5,240	188,640	107,525
Wyoming .....	.....	.....	.....
Colorado	11,605	353,952	162,818
New Mexico	1,120	37,856	20,821
Arizona .....	.....	.....	.....
Utah	5,624	208,088	97,801
Nevada .....	.....	.....	.....
Idaho	11,034	386,190	185,371
Washington	37,311	1,484,978	668,240
Oregon	27,938	812,996	398,368
California	872,833	9,164,746	5,957,085
Oklahoma .....	.....	.....	.....
Indian Territory .....	.....	.....	.....
Total	2,583,125	55,792,257	\$23,064,359

BARNARDO'S HOMES. These institutions, founded by Dr. Barnardo in 1866, are homes for orphan waifs. The principle upon which they are conducted is the admission of all destitute children of either sex whatever be their creed, nationality, age, or physical defects. The first one was established in a small house in Stepney Causeway, but the number of applications for admission was so extensive that new institutions were opened in rapid succession, and in 1898 it was reported that there were eighty-six of these homes, of which seventeen were in the English counties, four in Canada, one in Jersey, and the others in London. There is a large village home at Ilford, Essex, containing about one thousand inmates. About fifteen hundred children are boarded out in the rural districts. Industrial training is given and efforts are made to secure employment for those who have received instruction. An emigration agency is maintained and a large number of the children emigrate to the colonies, especially to Canada, where there are so-called distributing homes and an industrial farm. Down to 1898, it was estimated that about ten thousand children had secured situations and that 98 per cent. of these had succeeded in their employment. It was also stated that as many as 36,000 young people had passed through the homes. The headquarters are 18-26 Stepney Causeway, London, E.

BARON DE HIRSCH FUND. organized in 1889, for the benefit of the Russian-Roumanian emigrants. It teaches them to become good citizens, holds day and night schools, where the attendance is 900, and supports a trade school on 64th street, New York, near Second avenue. President, Myer S. Isaacs; Treasurer, Emanuel Lehman; and A. S. Solomons, General Agent. Headquarters, 45 Broadway, New York. See **JEWS**.

BARRES, MAURICE. See **FRENCH LITERATURE** (paragraph Fiction).

BARRIOS, JOSE MARIA REYNA, President of Guatemala, was assassinated February 8, 1898. He was born at San Marcos, Guatemala, in 1855; was educated abroad; and when only thirteen years of age was among the volunteers led by his uncle, Justo Rufino Barrios, who were attempting to overthrow the government of President Carna. He was connected with subsequent assaults upon the "tyrannical" government, and was promoted in military rank for services rendered in various battles, including Retalhuleu, San Lucas, and Tierra Blanca. He held high rank in the army under the presidency of his uncle, after whose death in 1885 the National Assembly raised him to the grade of division general. He soon after became minister of war and then vice-president, and on March 15, 1892, was elected to the presidency. His term of office would have legally expired in March, 1898, but owing to the internal disturbances of Guatemala he had practically become a dictator. See **GUATEMALA**.

BARTLETT. SAMUEL COLCORD, D. D., LL. D., ex-President of Dartmouth College, died at Hanover, New Hampshire, November 16, 1898. He was born at Salisbury, N. H., November 25, 1817, prepared for college at Pinkerton Academy, Derry, N. H., and was graduated at Dartmouth in 1836. For two years he was principal of the Caledonia County Grammar School in Peacham, Vermont, and then (1838) became an instructor at Dartmouth. In the following year he entered Andover Theological Seminary, at which he was graduated in 1842; he was ordained in 1843 and became pastor of the Congregational Church at Monson, Massachusetts, where he remained until 1846. At this time he became professor of moral and intellectual philosophy and rhetoric at the Western Reserve College; he resigned this position in 1852 to assume the pastorate of the Franklin Street Congregational Church in Manchester, N. H. He remained here until 1857, and for the next two years was pastor of the New England Church in Chicago. In 1858 he became professor of biblical literature in the Chicago Theological Seminary, which opened at that time; though he kept up his work as an occasional preacher, as assistant in the organizing of new churches, and as associate editor of various religious papers, he remained in the seminary for nineteen years, when he accepted a call in 1877 to succeed Asa Dodge Smith, D. D., LL. D., as president of Dartmouth. While connected with the seminary he passed many months travelling in Europe, Palestine, and Egypt, and in 1874 he crossed the desert of El Tih for the purpose of studying in detail the conditions of the region which is supposed to be the scene of the wanderings of Israel. When he came to Dartmouth he did not find the college in a flourishing condition, but under his administration improvement was quite apparent. On account of opposition on the part of many of the alumni, Dr. Bartlett resigned from his position as president in 1892 and was succeeded by the present incumbent, William Jewett Tucker, D. D., LL. D. Dr. Bartlett was always interested in biblical and literary subjects; besides frequent contributions to the magazines and to religious papers, he published *Life and Death Eternal, A Refutation of the Doctrines of Annihilation* (1866); *Sketches of the Missions of the American Board* (1872); *Future Punishment* (1875); *From Egypt to Palestine, Observations of a Journey* (1879); *Sources of the History of the Pentateuch* (1883); *Veracity of the Pentateuch* (1897). At the time of his death he had been for thirty-seven years a member of the American Board of Commissioners

for Foreign Missions, fifteen years president of the New Hampshire Home Missionary Society, and often a member of the national council of Congregational churches.

BARTON, CLARA. See RED CROSS.

BASE BALL. The public interest in base ball showed a falling off in 1898, owing partly to the excitement arising from the war, and partly to the disreputable character imparted to many of the games by the rowdyism of the players. In the championship campaign the "Bostons" won the pennant. The following table shows the number of games won and lost by the members of the League, together with the percentage of victories:

Clubs.	PENNANT RACE RECORD FOR 1898.		Percent-
	Won.	Lost.	age of Vic'r's.
Boston	102	47	.685
Baltimore	96	53	.644
Cincinnati	92	60	.601
Chicago	85	65	.567
Cleveland	81	68	.544
Philadelphia	78	71	.523
New York	77	73	.513
Pittsburg	72	76	.486
Louisville ..	70	81	.464
Brooklyn	54	91	.372
Washington	51	101	.336
St. Louis	39	111	.260

In the amateur field the record of Harvard, Princeton, and Yale was as follows: Yale, 4 victories; Princeton, 3; Harvard, 1. In the Inter-Collegiate Association, comprising Dartmouth, Williams, and Amherst, the championship was won by Dartmouth, Williams standing second, and Amherst third.

BASUTOLAND lies to the northeast of Cape Colony and consists of a well-watered tract of 10,293 square miles and a population estimated in 1895 at 250,000. The capital is Maseru with a population of 862, including about 100 Europeans. The exports are for the most part grain, cattle and wool. The mineral resources are as yet undeveloped but are said to include iron, copper and coal. Mines of the last named mineral are worked for the local supply. The roads of the country have been improved and extended in recent years. The work of education has gone on actively and the revenues have shown a slight but steady increase since 1891. There is postal communication with Cape Colony and the Orange Free State and telegraphic communication with the former. Basutoland is under the government of a resident commissioner subject to the High Commissioner for South Africa. The Resident Commissioner in 1898 was Sir G. Y. Lagden. In 1871 Basutoland was annexed to Cape Colony but became a crown colony in March 1884.

BATCHELLER SYSTEM OF PNEUMATIC DESPATCH. See PNEUMATIC DESPATCH.

BATES, GENERAL ERASTUS NEWTON, first United States Senator from Minnesota, died at Minneapolis, May 30, 1898. He was born in 1828 at Plainfield, Massachusetts, and in early life went to Ohio; in 1855 he removed to Minneapolis, where he remained until shortly before the war, when he went to Springfield, Illinois, and there enlisted with the Eightieth Illinois Volunteers. He was advanced rapidly for meritorious services, holding at the close of the war the rank of brigadier-general. He and his command were captured and imprisoned at Andersonville and Libby, and he was not exchanged until the end of the war. For two terms he was State Treasurer of Illinois and later, on account of ill health, declined the Democratic nomination for Governor of the State. He was one of the framers of the charter of Minnesota, a member of the higher branch of its legislature, and its first Senator at Washington.

BATHS. See MUNICIPAL BATHS.

BAVARIA. *Population and Religion.*—According to the census of 1895 the population of Bavaria was 5,818,544 of whom 35.5 per cent. lived in towns of 2,000 inhabitants and over. The emigration from Bavaria has been considerable, though it has fallen off since 1892. By far the greater portion of the inhabitants belong to the Roman Catholic Church, the religious division of the population showing on December 2, 1895, 4,112,623 Roman Catholics, 1,640,133 Protestants and 53,750 Jews.

Production.—The principal grain crops are wheat, rye, barley and oats. Fruits, vegetables and tobacco are also produced. The vine is cultivated to some extent and in 1896 1,288,578 hectoliters of wine were produced, a considerable increase over the product of 1890. The brewing of beer is a very important industry in Bavaria,

the quantity manufactured in 1896 being 16,198,126 hectoliters. The production of hops is carried on extensively. Manufactures are not very highly developed, but there are signs of progress. The exportation of glass to the United States has increased in recent years. Bavarian trade in general with the United States has increased as appears from the report of the American consul under date of January 31, 1898, which shows an increase of \$26,390 in the value of the exports from Fürth, Bavaria, to the United States during the month of January 1898, as compared with the corresponding month in 1897. There were 3,908 miles of railway in Bavaria in 1897, of which 3,335 belonged to the state.

Finance.—The most important sources of revenue to the state are the railways, post, telegraphs, mines, etc., indirect taxes, state domains, direct taxes, and fines, etc.; and the chief branches of expenditure are the cost of administration, the contribution to Imperial expenditure, and the service of the public debt. The public debt at the end of the year 1896 was \$1,418,443,185.

BAYARD, THOMAS FRANCIS, died at the home of his daughter, Mrs. Samuel D. Warren, in Dedham, Mass., September 28, 1898. His death had been expected daily for weeks, but his remarkable constitution and vitality deferred the end even beyond the hopes of the physicians. The funeral services were held October 1, in the old Swedish Church in Wilmington, Delaware, in which city he was born October 29, 1828.

As his elder brother intended to take up the law, young Bayard entered business, but when the brother died, he left the trade to become a law student, at the request of his parents, and having been admitted to the bar in 1851, began practice with his father, James Asheton Bayard, in Wilmington. In 1861 while both he and his father were firmly opposed to secession—Delaware was a slave State, it will be remembered—they were also opposed to coercion and vigorously denounced the war; it is seen now that the course they recommended was an impossible one, and it is thought the position Thomas Bayard took at that time was prejudicial to his later preferment. The Bayard family in Delaware, remotely descended from the Bayards of the fifteenth century in south-eastern France, may point with pride to the records of their ancestry in colonial times; and in the present century a national senatorship was almost hereditary with them, Thomas F. Bayard being the fifth United States Senator in the family. In 1869 his father, having already served in the Senate, was re-elected to serve out an unexpired term, and on the same day the legislature chose the son for the full term; thus the seat which James A. Bayard vacated on March 4, 1869, was immediately occupied by his son. Three successive times he was returned to the same seat, which he finally left in 1885 to enter President Cleveland's cabinet. With his election to the Senate came his recognition as one of the leaders of the Democratic party, which position he maintained until his retirement from public life in 1897. Three times he was considered for the presidency, and his failure to secure a nomination, at least in the second convention—that of 1880—was chiefly due to the fact that he came from a State which was not doubtful and which had only three electoral votes. In 1876, defeated by Samuel J. Tilden, he worked earnestly for the latter's election, and served on the commission which finally determined upon the successful candidate. He was defeated in the two succeeding presidential conventions by General Winfield Scott Hancock and Grover Cleveland respectively. Both politically and personally he was a close and true friend to Mr. Cleveland, whose Secretary of State he was from 1885 to 1889, and who made him first Ambassador at the Court of St. James from 1893 to 1897. During President Harrison's administration, Mr. Bayard resumed his practice of law in Wilmington.

In the Senate, Mr. Bayard was often on the losing side of public questions. His earnestness and sincerity were never doubted. By inheritance and education he was a believer to a great extent in the principle of States' rights, and it was due to this that after his death the rather extravagant statement was made of him that he lacked the ability "to grasp the meaning of the word nation." But his love for humanity, for peace, for amicable relations between the States was seen in his untiring efforts to heal the wounds and eradicate the antipathies occasioned by the Civil War. He was conservative, he had great respect for law, he was a "tower of strength on the side of honest money." He was opposed to the greenback movement and "his speeches against inflation in the issue of 1874, when a majority of both Houses of Congress sought to commit the government to the enlargement of an irredeemable and depreciated paper currency in time of peace, were exceedingly able. But for him the soft-money flood would have overwhelmed the Democracy far sooner than it did." His career as Secretary of State was able and sometimes even brilliant. It is interesting to note that despite his conservatism, despite his love for precedent and that which was well established, he was the pioneer of the American colonial idea in the Pacific. Just after his death a well-known journal said that "in 1885 and during part of 1886 the principal 'Jingo' and expansionist in the United States Government was Thomas Francis Bayard,

Democrat, of Delaware"—an interesting fact, since expansion was one of the foremost topics of discussion in 1898 and was generally championed by the Republican party. His career at the Court of St. James brought him more honors from the English than from his own countrymen. With the whole force of his strong personality and with all his grace and charm, he persistently strove to win the good will of Englishmen toward himself and his country. The speeches he made at this time were censured by many as being fulsome and unbecoming a patriotic American. In September 1895, English and American officials were roused to indignation by reason of a pamphlet, published by Lord Sackville, in which Ambassador Bayard was attacked for alleged discourtesies, when he was Secretary of State, to Lord Sackville, who was then the British Ambassador in this country. Mr. Bayard ignored the attack, which was unmerited and which reacted upon its author. On December 10 of the same year, Representative Barrett, of Massachusetts, introduced a resolution in Congress, demanding the impeachment of Mr. Bayard for statements made on the seventh of the preceding month in an address before the Edinburgh Philosophical Institution, since a part of the speech, it was said, could be "construed into an attack on the policy of protection." By amendment the resolution was made simply a call for investigation and report. Representative Barrett introduced a similar resolution in regard to Mr. Bayard's speech at Boston, England, on August 2, 1895, and Representative McCall, of Massachusetts, subsequently introduced one requesting the President to report what measures he had instituted for the conclusion of the matter. The resolutions were referred to the Committee on Foreign Affairs and were never noticed by the administration. In 1897 Mr. Bayard made a speech in London which called forth a rebuke from Mr. Richard Olney, Secretary of State. In England he stood very high in both popular and official regard, and however unpleasant his speeches may at the time have been for Americans, it is doubtless true that his influence had much to do in bringing about that era of good feeling and fraternalism among Anglo-Saxons, of which there was so much discussion in 1898.

The character of Mr. Bayard, both public and private, was beyond reproach; no word of scandal, corruption, or insincerity was ever truthfully spoken of him, and even his political opponents agree that his speeches in England were founded on love for his country and the belief that stronger sympathy on the part of the one nation with the other would be of great benefit to America. Mr. Bayard was an able speaker and a good scholar; he delivered many noteworthy addresses before various educational institutions, and received the degree of LL. D. from Harvard, and that of D. C. L. from Oxford and Cambridge. A man of great kindness, dignity, and courage, it was said of him, that like that Bayard of another age, he was a *chevalier sans peur et sans reproche*.

Mr. Bayard's domestic relations were of the happiest. In early life he was married to Miss Louisa Lee of Baltimore. They had twelve children. Mrs. Bayard died in 1885 and four years later Mr. Bayard married Miss Mary W. Clymer, of Washington.

BAYREUTH FESTIVALS. After the inauguration of the Festival Theatre under Wagner's direction in 1876, when *Der Ring des Nibelungen* was performed three times; it was closed until 1882, when *Parsifal* was first given. The Theatre again opened in 1883, and since Wagner's death in that year festivals have taken place in 1884, 1886, 1888, 1889, 1891, 1892, 1894, 1896, and 1897. *Parsifal* was given in 1882, 1883, 1884, 1886, 1888, 1889, 1891, 1892, 1894, and 1897. The Tetralogy of *Der Ring des Nibelungen* was given in 1876 and 1896; *Tristan und Isolde* in 1886, 1889, 1891, and 1892; *Die Meistersinger* in 1888, 1889, and 1892; *Tannhäuser* in 1891, 1892, and 1894; and *Lohengrin* in 1894. The next Festival will take place in the summer of 1899. Its programme is: *Der Ring des Nibelungen*, July 22, 28, August 14, and 19; *Die Meistersinger*, July 28, August 1, 4, 12, and 19; and *Parsifal*, July 29, 31, 5, 7, 8, 11, and August 20. See A. Lavignac's *Music Dramas of Richard Wagner* (New York, 1898).

BEARDSLEY. AUBREY, artist and writer, died of consumption at Mentone, France, March 16, 1898. He was born at Brighton, England, in 1874; was educated at Brighton Grammar School. In 1892 he began working for the *Pall Mall Magazine* and the *Pall Mall Budget* and subsequently was engaged by various publishers. He soon gained a wide reputation as a designer of striking and fantastic posters and book covers, and in 1893 was elected to membership in the New English Art Club. He published with illustrations *Bons Mots* (1892); *Malory's La Morte d'Arthur* (1893); Oscar Wilde's *Salome* (1894); *The Rape of the Lock* (1896); *An Album of Fifty Drawings* (1896). He was associated with *The Yellow Book*, for which he designed the covers and supplied many illustrations. He also contributed drawings to the *Savoy* and to *Le Courrier Français*. In 1895 he wrote and illustrated *The Story of Venus and Tannhäuser*, and in 1896, a novel entitled *Under the Hill*. Shortly before his death he was engaged upon an illustrated edition of Mlle. de Maupin.

BECHUANALAND. See RHODESIA.

BET SUGAR. See SUGAR.

BEHRING SEA DISPUTE. At the close of the year 1897 the Behring Sea difficulty again occupied the public attention. To understand the points at issue a brief review of the history of the controversy will perhaps be necessary. One of the chief inducements to the purchase of Alaska by the United States in 1867 was the great value of the seal fisheries which were the main sources of revenue in the territory. For many years after the purchase the revenue from the fisheries was very large. From 1870 to 1885 the annual catch was about 100,000 seals, but afterwards the number began to fall off owing to the intrusion of the Canadian fishermen, and in the year 1890 the Alaska Company took only 21,000 seals. For the statistics for 1898 see the article SEALING.

The home of the seals is on the Alaskan coast and their breeding place the Pribyloff Islands. The root of the international difficulty was in the fact that while both these places belong to the United States, the seals in passing from one to the other each year crossed a portion of the Behring Sea. While on their way to the Pribyloff islands they have been taken in large numbers by the Canadian fishermen, and many have been killed and have sunk below the surface before they could be taken. The destruction of the herd has thus been excessive. The United States government at length determined to put an end to this abuse, but according to international law the boatmen of foreign nations have a right to fish and hunt in all waters outside of the three-mile limit from the shore. The question was, Could the United States by any construction of international law regard the waters of the Behring Sea, traversed by the herd for the purpose of breeding, as under the exclusive jurisdiction of the United States government?

The United States took the view that this portion of the Behring Sea was not subject to the rule of international law which applied in general to the open sea, and it based this position on the Russian ukases of 1799 and 1821, the former claiming exclusive jurisdiction over the Behring Sea as far as latitude 55° north, and the latter extending this claim as far as 51° north. There was much discussion and a careful study of documentary evidence to answer the question whether Russia had really exercised these exclusive rights with the acquiescence of other nations. This, however, was but one part of the argument advanced by the United States, which has never claimed that all of the Behring Sea is to be regarded as *mare clausum*. The United States has urged in the first place that the seal is not a fish; secondly, that it lives on the coast of Alaska which incontestably belongs to the United States; and thirdly, that as the property of the United States it should receive protection in passing from one point to another even though the passage be through the open sea. Moreover, even in the case of fishing it is right to prevent the employment of such methods as are certain to result in the extermination of the fish. No nation which is able to defend its honor and dignity should permit injury to its property on the high seas, and it was urged that Great Britain had repeatedly acted on this principle in analogous cases. In 1887 the attempt was made to form a convention with Great Britain for the limitation of the time during which seals might be taken. It was pointed out that it was to the interest of Great Britain as well as to that of the United States that the herd should not be destroyed, for the sealskins were dressed and dyed in London. This attempt came to nothing on account of the opposition of the Canadian government. A second attempt was made in 1891 and at the same time arbitration was proposed. Great Britain consented to a *modus vivendi* for one year during which the wholesale slaughter of seals was to be checked, but at the expiration of this time she declined to renew the arrangement. Negotiations continued, however, and on March 29, 1892, the United States revived a treaty for submitting the matter to arbitration by a commission of seven members. Two of these members were to be appointed by the United States, two by Great Britain, one by France, one by Italy, and one by Sweden. It held its sessions in Paris and in 1893 the tribunal decided adversely to the claim of the United States to a property right in seals beyond the three-mile limit. No award, however, was granted in regard to illegal seizures of sealing fisheries by the United States. This matter was postponed with a recommendation that it be made the subject of several diplomatic negotiations. In 1896 a treaty was made for the settlement of the damage claims, which extended over a long period of time beginning with the seizure of the British vessels, *Caroline* and *Thornton*, August 1st, 1896. Arbitrators were appointed under the terms of this treaty, and on December 22, 1897, they rendered their award. The British claims amounted to \$850,000 and included not only the value of the vessels but the estimated value of the prospective catch. The amount awarded, however, was only \$473,151.26, which included merely the value of the vessels and their outfits and the interest on the amounts.

The regulations for the prevention of pelagic sealing framed in accordance with the award of the Paris tribunal of 1893 proved wholly ineffectual, and at a conference between British and American representatives at Washington in the autumn of 1897,

it was proposed by the Hon. J. W. Foster that England and the United States should agree upon a *modus vivendi* suspending the killing of seals for one year from December 1897. This request was refused by the Canadian government. Among the reasons assigned for the refusal were the fact that the fleet had made its preparations for sealing, and that the loss involved in giving up the proposed expeditions and disbanding the crews amounted to so much that it would be impossible to induce the Canadian parliament to vote a compensation. Moreover, Sir Wilfred Laurier declared that there was no immediate danger of an actual extermination of the herd. The United States government now shifted its policy, finding negotiation fruitless, and prohibited the killing of seals by American citizens, except persons connected with the North American Commercial Company. It prohibited also the importation of sealskins, raw, dressed, dyed or otherwise manufactured, unless accompanied by a certificate signed by a United States consul that the seals killed were not taken in waters of the Behring Sea and the Sea of Okhotsk. The design of this policy was to oblige Great Britain to enter into a treaty to prevent pelagic sealing by cutting off the market for the Canadian seals. Almost half of the seals caught have been purchased in the United States. The effect would naturally be also to injure the interests of those London houses engaged in the business of dying and dressing skins.

On June 14, 1898, the joint resolution appropriating \$473,151.26 to pay the award in the Behring Sea damage cases was passed by the United States Congress, thus bringing to a close one vexatious point of dispute in the sealing question, which had disturbed the two governments for about twelve years. This satisfactory adjustment was regarded as a gratifying result of the growing friendliness between the United States and Great Britain.

The question of the protection of the herd was still unsettled. The commission to whom the questions in regard to the sealing difficulty were referred in 1893, recognized the fact that the fur seal seemed threatened with destruction. But while the United States members of that commission held that the rapid diminution in the number of the seals was due to the wholesale slaughter of them, the British experts attributed it to the unscientific methods of killing them practised on the Pribyloff Islands: Great Britain has shown a willingness to consider plans for the preservation of the seals, but she had always refused to recognize the claim of the United States to exclusive rights in the matter. The commission decided in the first place, that although the United States had succeeded to all the rights of Russia in Alaska and in the islands and waters adjoining, this country had no exclusive jurisdiction over the Behring Sea beyond the usual three-mile limit from the coast. It was also decided that Great Britain had never recognized Russia's exclusive jurisdiction over the seal fisheries of Behring Sea beyond the usual limit. Another decision was that the United States had no right to the protection of a property in the seals frequenting its islands in the Behring Sea when the same are found outside of the ordinary three-mile limit. The commission next took up the general question of protection. In the first place, it laid down the rule that no sealing should ever be carried on within 60 geographical miles of the Pribyloff Islands. In the second place, it prescribed under what conditions sealing should be allowed within the Behring Sea outside of this zone and in a certain wide stretch of the North Pacific Ocean. The conditions limited the privilege of sealing to sailing vessels under special license and carrying a distinguishing flag. The season should be open only from August 1 to May 1, and nets, guns or explosives were not to be used in taking the seals. It was furthermore required that the number, sex, date and place of capture of the seals should be reported. Both the American members dissented from this rule as well as from the decision against the American claim to a right of protection over the seals frequenting the islands in the Behring sea beyond the three-mile limit. But the United States was of course bound by the award of the commission, which by the terms of the international agreement was to bind both governments until they should mutually agree to abolish or modify it. After five years it was subject to revision. The award settled once and for all the question of a property right in the seal at sea. The claim to such a right had been vigorously and ingeniously urged by the United States for many years. The arguments for it rested on humanity, self-defense and state necessity, while those against it were based on the premise that legally and historically the United States had no jurisdiction over the Behring Sea.

BELGIUM. The area of Belgium is placed at 11,373 square miles and its population on December 31, 1896, was 6,495,886 (according to a later estimate, 6,586,593). The former figures give it an average of 571.1 persons per square mile, making it one of the most densely populated countries in the world. The census returns of 1890 gave 2,485,072 as the number of Belgians who could speak French only, and 2,744,271 as the number who could speak Flemish only. Almost the entire population professes the Roman Catholic religion, the Protestants numbering 10,000 and the Jews about 4,000.

Coal Production.—On October 18, 1898, the American Consul at Brussels reported that the total amount of coal produced in Belgium during the year 1897 amounted to 21,492,446 tons, valued at \$42,589,715, and exceeding by 240,076 tons the production of 1896, which had been considered the largest ever realized in Belgium. Among the important facts which he reported in regard to the coal mining industry of 1897 was the decrease in the number of women and girls employed in the interior of the mines and also of the number of boys; and an increase in the average annual salary of the laborer of \$10.23 over that of 1896. It was also stated that there were 48 strikes in the various mining sections throughout the year, of which one was of considerable dimensions and only 4 were partially successful in so far as gaining an increase of wages had been the motive of the strikes.

Foreign Trade Policy.—There is no separate department in Belgium devoted to the interests of commerce and industry, but in one way or another these matters come under the control of the Minister of Industry and Labor, the Minister of Foreign Affairs, of Finance, of Agriculture and Public Works, and of Railways. As to specific measures adopted by the government for the promotion of trade it may be mentioned that neither in the matter of subsidizing the merchant marine nor in the promotion of technical education does the government actively interfere. It formerly granted subsidies to the merchant marine, but in 1898 the only line of vessels receiving a subsidy was the North German Lloyd. Two schools for the study of navigation are maintained by the government. But with these exceptions and the fact that it has made every effort to render Antwerp the most important port on the continent, it has left the development of trade to private enterprise. Technical and industrial schools have been established chiefly by private enterprise but in some cases by the municipal authorities. The foreign trade policy was protective from 1831 until 1855, after which changes were made resulting in the establishment of a tariff for revenue only, which system continued from 1861 until 1884. In that year the government laid an import duty upon cattle and meats and in 1896 a duty upon oats, butter, etc. Since the period of the most rapid development in Belgium coincides with that which followed the adoption of the tariff for revenue only, the supporters of the latter system have found a strong argument in its favor. Among the factors which have tended to promote foreign trade are the well organized chambers of commerce of the different cities.

Commerce.—In 1896 the general imports amounted to 3,037,371,700 francs and the general exports to 2,720,302,115 francs. In 1896 it exported to Germany goods to the value of 327,258,000 francs; to France 287,539,000 francs; to Great Britain 291,202,000 francs, and to the United States 48,912,000 francs. The value of its imports from these countries in the same year was from Germany 215,395,000 francs; from France 310,611,000 francs; from Great Britain 205,618,000 francs, and from the United States 173,650,000 francs. The chief articles of export were yarn, linen, wool, etc., coal and coke; textiles, raw; glass, etc.; and the general articles of import were cereals; textiles, raw; chemicals; timber; and mineral substances. The American Consul at Liège, writing under date of June 24, 1898, gave a summary of the commerce of Belgium for the year 1897. It seems that the commerce of Belgium for that year was three per cent. in excess of the commerce for the preceding year. The imports and exports in 1897 aggregated \$1,144,123,300, and besides this the trade in diamonds amounted to nearly \$22,000,000. The imports from the United States in 1897 showed an increase of 33 per cent. over the preceding year. They were valued in 1897 at \$44,718,100. The items which showed the greatest increase were grain, drugs, cotton, meats, oak and walnut woods, horses, vegetables and vegetable substances, resin and bitumens, and fruits. The imports from Belgium to the United States in 1897 increased 24 per cent. over the previous year. They amounted in 1897 to \$11,657,200. The items of the imports which showed the greatest increase in 1897 were caoutchouc, sugar (unrefined), skins, dyes, coals, linen and woollen goods, chemical products, fire-arms and rugs. The balance of trade between Belgium and the United States continued favorable to the United States, showing a considerable increase over the preceding year.

Early in 1898, an important institution was founded in Belgium for the furtherance of American and English commercial interests in that country. This was the Anglo-American Chamber of Commerce, to consist of Englishmen and citizens of the United States as well as all others who are interested in the trade between Belgium, England and the United States. Its seat is in Brussels, Belgium. A council of thirty members consisting of British subjects and United States citizens manages the affairs of this Chamber. Membership in the Chamber can be obtained by the payment of a moderate fee. One of its objects is to supply information in regard to the standing of firms, together with the names of firms engaged in particular trades. It also enables the British or American merchants to secure agents and representatives in Belgium by placing them in communication with firms or individuals of good standing who would be likely to form that connection with them. It supplies reliable information in regard to the condition of trade in Belgium and

gives notice of changes in the tariff and in customs regulations. It intervenes on behalf of its members when the latter claim to be unduly taxed, either by their home governments or by the government of Belgium. It places books of reference at the disposal of its members, renders legal opinions on matters affecting the commercial interests of the three countries and aids British and American merchants in taking part in trade exhibitions.

In 1898 an inquiry was made through the United States Consul into the condition of the lumber trade. The forests of Belgium are totally inadequate to supply the domestic demands and the importation of large supplies of lumber is necessary. These supplies have been drawn chiefly from Sweden and Norway, Russia and Germany. The trade of the United States with Belgium, though it had increased rapidly since 1893, was inferior to that of any of these countries but it was hoped that by a more careful adaptation of business methods to the usages of the Belgium importers the trade of the United States in lumber might be greatly advanced.

Labor and Industries.—An important event in the industrial history of Belgium was the appointment of an international convention on tariff and labor to be held at Antwerp in September 1898. In this international convention all who were interested either theoretically or practically in industrial affairs were invited to take part. The topics discussed included such matters as the effect of different tariff systems on the producer and the consumer, the suitable basis of tariff legislation, the value of treaties of commerce, and the effecting of improvements in the commercial statistics of foreign countries. The section devoted to the discussion of labor questions dealt with such subjects as the best form of trade unionism, the value of a systematic inspection of work, the question of legislation in regulation of the relations between employer and workman, and the effect of laws reducing hours of labor upon production and wages.

It was reported by the American Consul at Brussels in 1898, that there were signs of increased activity in nearly all of the Belgian industries in that year. The mining and metal-working industries and the manufacture of fire-arms and glass were all in good condition and giving steady employment to workingmen. There were strikes in the furniture industry in Malines, but the difficulty was adjusted without serious injury to the trade. The condition of the diamond-cutting industry was less fortunate, a serious and protracted strike having taken place.

Shipping, Post-office, and Telegraphs.—In 1896 the total tonnage of vessels entered and cleared in Belgian ports was 14,971,182. The working of the post-office in Belgium was in 1896 as follows: Private letters 110,566,990, printed matter 91,274,339, newspapers 101,513,576, postal cards 45,376,318, and official letters 20,597,401. On January 1, 1896, there were 864 post-offices and 1,002 telegraph offices. The total length of public telegraph lines was 3,955 miles, and the length of wires was 39,000 miles. In Belgium in 1898 important experiments were made in underground telegraphy. In 1896 the railway mileage open for traffic was 2,839.

Finance.—In 1898 the estimated ordinary revenue of Belgium was 388,298,598 francs and the estimated ordinary expenditure was 385,278,702 francs. In 1897 the national debt, which consisted of a share of the Netherlands debt at 2½ per cent., loans at 3 per cent., and a floating debt (treasury bonds), was 2,328,497,322 francs. See table following the article MONEY.

History.—Down to the year 1893 there were practically only two political parties in Belgium. These were the Clericals, or Catholics and the Liberals, or Anti-Catholics. But in the discussion of the revision of the Constitution during the years 1893 and 1894, there was a recasting of party lines resulting in the development of new groups. The Liberals divided into three groups, comprising first, the extremists, who were Socialists and formed the labor party; second, a more moderate but still advanced party known as the Progressists, and third, the rank and file of the Liberal party who adhered to their policy of the past. In the general election of October 1894 the Clericals secured a large majority over both the Liberals and Socialists, and in the summer of 1896 the Clerical gain was further augmented. The strength of the Clericals is greatest in the Flemish provinces, while that of the Socialists is greatest in the Walloon provinces. An interesting phase of recent party politics in Belgium is the language dispute. The Flemish tongue is spoken in the north, while the Walloons of the south speak French. The two languages merge on the borders into various dialects and, linguistically, the country is in a somewhat confused condition. The important question involved is what tongue shall be the official language. At present the official language, that is the parliamentary and legal language of the country, is French, but there has developed recently a strong nationalist Flemish party that demands the placing of Flemish on an equal footing with French as the official tongue. In the Parliament session of 1897, a bill was introduced for this purpose by Deputies Coremans and De Vriendt. The watchword of the party which they represented was "the Flemish tongue for Flanders." Agitation of the matter was stimulated by the growing racial pride of the Flemish, and the revival of interest in their national literature and history. The gains in the Clerical

majorities in recent elections marked the triumph of the Flemings over the political and religious liberalism which was generally characteristic of the Walloon element. Moreover, the Flemings in point of numbers are the strongest, being estimated at about three-fifths of the total inhabitants. They held that the free official use of their own tongue would place them on a fair footing with their rivals, the Walloons, who spoke French from their earliest years. They declaimed against the injustice of compelling a man to use a foreign tongue in the courts of his own country and to enforce his obedience to laws written in French. The question, however, did not involve racial antagonism on other grounds, for the Flemings freely admitted that the Walloons were as good Belgians as themselves. They did not pretend that a linguistic difference constituted a difference in national aims. Their arguments rested mainly on principles of abstract justice. The Walloons objected to the change on practical grounds. They held that the Flemish tongue which was spoken only in a small corner of the world would, if it became the official language of the country, isolate Belgium and impede her progress. French was the language of culture, of commerce and of politics. It was the language of international affairs, and to revert to the use of a tongue so little known, was a step backward. There were better reasons for a Fleming to learn French than for a Walloon to learn Flemish. The Walloons complained that the passage of the Coremans bill would place them in a position of inferiority. The bill passed the Chamber of Deputies and its supporters had high hopes that it would go through the Senate successfully. They were bent on its being passed as it stood, and declared that they would withdraw it if attempts were made to modify or amend it. Before the Senate voted upon it there was time for the opinion of the country at large to make itself heard. From centres of trade and learning there came protests from prominent men among both the Walloons and the Flemings. It was objected by the lawyers that the change would needlessly complicate legal affairs and a practical point was urged against it in the difficulty of translating the language of the laws into Flemish. Many of the Flemish themselves seemed to think that it would be injurious to the country and would sharpen the rivalry of the races. All sides of the question were brought out in the Senate debate and clause after clause was rejected. As the measure was finally passed all that was left of it was the provision that henceforth the laws should be published both in Flemish and French. Rather than accept such a small fraction of what they had originally demanded, the supporters of the measure withdrew it altogether.

Among the important questions discussed during the year 1898 was that of proportional representation. The *scrutin de liste* is said to result in injustice and in the election of candidates who represent but a small part of the voters. Many men of moderate views appear to favor the establishment of the new principle. But a measure looking to that end was rejected by Parliament. As a result of the general elections but little change was made in the character of the Chamber. The number of the Socialist deputation to Parliament was reduced from 29 to 28; the Clerical majority gained one vote and the Liberals remained the same as before. The Parliamentary session closed on May 6 and reopened on November 8. Among the important events of the year were the following: On April 11 the opening of a Socialist congress at Verviers; on April 14 a meeting of the congress of commercial education at Antwerp; on June 7 the meeting of an international congress on sugar at Brussels; on July 26 the meeting of an international congress on navigation at Brussels; on August 13 the establishment of a permanent commission for the examination of questions of international and private law at Brussels; on September 13 the meeting of the tariff and labor conference above mentioned; on September 28 the meeting of an international congress of art at Brussels; on October 1 the meeting at Antwerp of the international conference on maritime law; on November 15 the re-election of Beernaert as president of the House of Representatives; on December 25 meeting of the national congress of miners.

BELLAMY. EDWARD, American novelist and "nationalistic" writer, was born in Chicopee Falls, Massachusetts, March 26, 1850, and died at his home there May 22, 1898. After a partial course in Union College and a year of travel he was admitted to the bar in Hampden county, Mass., in 1871, but gave up his profession and until 1872 was an editorial writer for the New York *Evening Post*. He was an editor of the Springfield, Mass., *Union*, 1872-77, and in the latter year with his brother, C. J. Bellamy, started the Springfield *Daily News*. His works of fiction are *A Nantucket Idyl* (1878); *Dr. Heidenhoff's Process* (1880); *Miss Ludington's Sister* (1884); *Looking Backward* (1888). The socialism advocated in the last named work—which was very successful—was further developed by articles in the Boston *New Nation*, the editorship of which Mr. Bellamy assumed when he established the paper in December 1891. He also delivered many lectures on the same subject. In 1897 he published *Equality*, which is a careful amplification of the principles laid down in *Looking Backward*, and which, though widely read, did not attain the popularity of its famous predecessor.

BELOOCHISTAN or **BELUCHISTAN.** See **BALUCHISTAN.**

BEN HUR, TRIBE OF, a fraternal and benevolent organization founded in 1894, has 451 subordinate courts, 17,448 members, and a supreme temple at Crawfordsville, Ind. Since its organization it has disbursed \$217,450 and \$74,700 during its last fiscal year. D. W. Gerard, Crawfordsville, Supreme Chief; F. L. Snyder, Crawfordsville, Supreme Scribe.

BENNETT, EDMUND H., Dean of Boston University Law School, died January 2, 1898. He was born in Manchester, Vermont, April 3, 1824, was graduated at the University of Vermont in 1843, and in 1847 was admitted to the bar. He was judge of probate and insolvency for Bristol county, Massachusetts, from 1858 to 1883; mayor of Taunton, 1865-67; and lecturer at Harvard Law School 1865-71. In 1880 he became Dean of the Boston University Law School, which position he held at the time of his death.

BERMUDA, consisting of a group of numerous small islands (about 20 inhabited and 340 uninhabited) lying 580 miles east of the North Carolina coast; with an area of about 20 square miles and a population in 1896 of 15,952 (including 6,117 whites) is a British colony with representative government, having a governor, (Lieut. Gen. G. Digby Barker in 1898), an Executive Council appointed by the Crown, a Legislative Council also appointed by the Crown, and a House of Assembly chosen by electors and consisting of 36 members. A British garrison is stationed there. The chief town is Hamilton (pop. 1,296). The surface of the islands is remarkable for the fine scenery and the fertility of its soil. It is said that the ground often yields four crops of different vegetables within a year, but most of the farmers have not the skill and knowledge to make the most of this advantage. On the other hand the estates of the large planters are skillfully and effectively cultivated. The American Consul, in his report dated August 12, 1898, refers to an estate on which one acre planted in tomatoes yielded a crop worth \$1,500, and an acre of lilies yielded a return of \$1,800. All the chief exports go to the United States. These are onions, tomatoes, potatoes and lilies. In 1896 a parasitic disease attacked the lily plant and also seriously injured the crops of vegetables. The raising of fruit, which was formerly a most profitable industry, has been almost discarded, except in the case of bananas, on account of the disease to which the plants were subject. The estimated revenue for 1897-98 was £33,066 and the expenditure £38,089, the chief source of revenue being the customs. The public debt in 1896 was £46,600. In that year the exports amounted to £108,613, and the imports to £304,970. The Church of England is represented by over 10,600 members. The Bermudas are a favorite winter resort for Americans.

BERTILLON, ALPHONSE, the well-known anthropometrical expert, whose system, called the "Bertillon System" for the identification of criminals has been introduced in some of the States of the United States. He was born in Paris in 1853 and has written a number of works on anthropometry and the identification of criminals, including *Identification Anthropométrique* (1893). He is known also as an expert in hand-writing, although his method has been called into question by other experts. When the question of the identity of the *bordereau* with the hand-writing of Dreyfus arose, Bertillon maintained that Dreyfus had written the *bordereau*, although it was evident that he had tried to disguise his writing by changing it from hand-writing that slopes to the right, to a style that slopes to the left. His testimony at the Zola trial was said to be inconclusive, and Zola's counsel remarked at the conclusion with sarcastic emphasis, "And that is the man upon whose evidence Dreyfus was convicted." See FRANCE (paragraphs on History).

BESSEMER, SIR HENRY, English inventor, died in London March 14, 1898. He was born at Charlton, in Herts, England, January 13, 1813, and was chiefly self-instructed. His discovery of a rapid and cheap means of converting pig-iron into steel by forcing a blast of air through the iron when in fusion completely revolutionized the steel industry of the world in a period of about thirty years. His completed process cost him an immense amount of labor and expense, accompanied with many disheartening failures, but it is said that he realized from his patents \$5,000,000. At the time of his death it was stated that in Great Britain and the United States there was an annual output of 20,000,000 tons of steel, selling at an average price of less than \$25 a ton, while forty years before "the price was \$250 or more a ton, and the production was only a two-hundredth part of the present output." Mr. Bessemer was led to his discovery through his study of the manufacture of guns and projectiles. His inventions were not limited to the manufacture of steel, but included, among others, a perforated stamp for canceling checks, a kind of gold and bronze paint, steamboat designs, improvements in large telescopes, methods of electroplating with copper, processes of sugar-refining, and improvements on the centrifugal pump. A number of towns have been named after him, among which are Bessemer, Alabama, and Bessemer, Michigan. He was knighted in 1879; and was president of the Iron and Steel Institute of Great Britain.

BETTS, GEORGE FREDERICK, lawyer and soldier, was born in Newburg, New York,

June 14, 1827, and died in New York City January 18, 1898. After his graduation from Williams College in 1844, he attended the Harvard Law School and was admitted to the bar in 1848. During the Civil war Mr. Betts was lieutenant-colonel of the Ninth New York Volunteers. For nearly twenty-five years he was clerk of the United States District Court for the southern district of New York, of which his father was judge until 1878.

BIBLIOGRAPHICAL SOCIETY OF LONDON, 20 Hanover square, founded in 1892. In 1894 the membership was limited to 300. A. W. Pollard of the British Museum was appointed London Secretary and Ernest Dressel North, New York, the American Secretary. President, the Right Hon. the Earl of Crawford. Object, the study of bibliography, the founding of a library of bibliographical reference books, and the printing and publishing of books relating to bibliography.

BICYCLE PATHS. During 1898 the legislature of Massachusetts authorized cities and towns to lay out, construct and maintain bicycle paths. In Ohio, county commissioners were authorized to tax bicycles \$1 each a year and use the proceeds for bicycle paths. In New York, bicycle paths have been built in some counties under legislative authority and in that and some other States such paths have been constructed by wheelmen at private expense.

BICYCLING. In 1898 the world records in bicycling were broken in the case of the mile dash, which was reduced to 1 minute, 32 $\frac{3}{4}$ seconds on August 5, 1898; of the hour run, which was reduced to 34 miles, 1,220 yards on August 6; of the 100 miles run, which was reduced to 3 hours, 25 minutes, 53 $\frac{3}{4}$ seconds on August 30. The first two records were made in the United States and the last in England. A conspicuous event of the year was the six-day bicycle race held at Madison Square Garden, New York City, during the first week in December. Much comment was aroused in the newspapers by the extreme test which this contest imposed upon the participants. It was won by Charles W. Miller of Chicago, who covered 2,007 miles and 4 laps.

BILLIARDS. A championship game was played at Madison Square Garden on December 3, 1897. At this Jacob Schaefer of New York defeated Frank C. Ives, also of New York, Schaefer's points amounting to 500 and Ives's to 401. On December 4 George F. Slosson defeated Ives. The year 1898 was comparatively uneventful. Only two important professional matches were held and there was not much activity in the amateur field. An open tournament was held in Chicago beginning January 17, in which Ives and Schaefer tied for first place, the score being in each case three games won and one lost. The other contestants were Sutton, Catton and Spinks. Ives and Schaefer played a match balk-line game of billiards for the world's championship at Chicago on April 2, Ives winning by a score of 600 to 427. The former noted champion, Mr. William Sexton, died in New York April 25, 1898. He was famous for his match with the French champion, Maurice Vignaux, in 1876, at which, though he lost, it was evident that his skill was nearly equal to that of his well-known antagonist.

BILLOT, JEAN BAPTISTE, a French general, prominent in connection with the Dreyfus case, was Minister of War in the Méline Cabinet, and had previously held the same portfolio in 1882. It was he who in reply to questions in the Chamber of Deputies regarding the Dreyfus affair, said that on his soul and conscience as a soldier, he believed the judgment was well deserved, and that Dreyfus was guilty. He was charged by M. Clemenceau with having said in the course of a private conversation in the Senate, that if pressure was not brought to bear on the court, France would be involved in a revolution. He has a good record as a soldier, having fought in Algiers, Mexico, and the Franco-Prussian War. He was chosen Senator in 1875, and has been decorated with the grand cross of the Legion of Honor.

BIMETALLISM. Although the discussion of bimetallism continued actively during the year 1898, the events of that year were not on the whole propitious from the point of view of the bimetallist. In fact the single gold standard seemed more strongly entrenched throughout the world than ever before. By way of introduction to an account of the controversy of the standards during the year 1898, the following brief survey of the recent history and present status of the monetary systems of the world may be of interest. The last thirty years have seen a great change in the relation between the precious metals. Silver which for centuries had been on an equal footing with gold, has in most civilized nations been reduced to the rank of a token currency. At the present time Mexico is the only important state that adheres to silver as the standard of value. It is a currency with which she, as a great producer of silver, can supply herself cheaply and easily. Discrimination against it furthermore would be a discrimination against one of the most important of her native industries. Until recent years four great countries were ranged on the side of silver. These were the United States, India, Japan, and Russia. The placing of the United States in this list, however, is somewhat misleading. At the time when the act demonetizing silver was passed in 1873, that metal being at a premium was

practically obsolete as currency except as subsidiary coin. Nevertheless between the years 1878 and 1893 the United States Congress tried to improve the status of silver or maintain its existing parity with gold by means of enormous purchases of silver bullion. So far as it was hoped that this would maintain the market price of silver it was a failure. Under the Bland-Allison and Sherman acts 460,000,000 ounces of that metal were purchased. By a comparison between the price of silver at the time when it was bought under the provisions of these acts with its present market price, it will be found that the government lost by the operation about \$200,000,000. At last in 1893 the purchasing clause of the Sherman act was repealed and this country was placed definitely upon a gold basis. Then followed the period of reaction and uncertainty which was closed only by the defeat of the free silver candidate, Mr. Bryan, in 1896. Down to 1893 the United States was purchasing about one-third of the average silver production of the world. While these purchases did not prevent the steady depreciation of silver it can not be determined to what extent they hindered its depreciation from going further than it did. In the same year that the United States abandoned its policy of silver purchases, India, which had been buying about one-fourth of the silver production of the world, closed its mints to silver. Down to that time India had been a great ally of the cheaper metal; while silver was falling the Indian government was buying it on an increasing scale, the average annual import having risen from 23,000,000 ounces in the period from 1872 to 1885 to 53,500,000 ounces in 1890, and to a still higher figure in 1893. Naturally the withdrawal of these two great buyers from the market led to a further fall in the price of the white metal.

Next comes the defection of Japan and Russia. Japan had originally a silver standard, but after the war with China as a result of which she had been able to exact a large indemnity in gold, she demonetized the yen and set up the gold standard. In Russia the monetary difficulty arose from the existence of an inconvertible paper basis, from which she has lately been trying to escape by an accumulation of gold through borrowing, through the collection of her custom dues in gold and through the hoarding of the proceeds of her Siberian and other mines.

The causes of this monetary revolution are the debatable ground in the contests of bimetallists and monometallists. The weight attached to natural causes, such as the greater convenience of gold in making large payments, or the great increase in its production since 1850, will vary according as a man inclines to one or the other schools of thought. The bimetallists naturally attach more importance to secondary causes, such as the influence of Great Britain which, since the close of the seventeenth century has been moving towards a gold standard, and especially the action of the governments in closing their mints to silver. There is no doubt that this latter cause has had an important influence. The withdrawing of such powerful elements in the demand must of necessity have lowered the value of that metal. We should expect to find the closing of the mints to silver followed by a greater disparity between the market values of the two metals, and this very thing has happened. Naturally enough it is a matter of debate how far this disparity is to be attributed to the appreciation of gold and how far to the depreciation of silver. Much needless confusion results from an ambiguous use of terms and a failure to see the identity of a proposition when stated in a little different language. As compared with gold, silver seems to have fallen about 55 per cent.; whereas forty-five principal commodities, when compared with gold, have fallen off about 35 per cent. To what extent demonetization has caused this greater depreciation of silver relatively to gold than of commodities is a question that can only be answered theoretically.

The points of practical importance are that silver has been rejected by the governments of civilized nations as a standard of value and that whether as a consequence or not there has been a general falling of prices measured in gold. This falling of prices has taken place in spite of a great increase in the annual output of gold. The annual production which in 1873 was about \$100,000,000 rose to about \$250,000,000 in 1898. During the last seven years it is estimated by an English economist that the world has produced £257,000,000. The question is, What has become of all this gold and why has it not prevented the fall of prices? One answer may be found in the fact that about £157,000,000 of this gold was absorbed by the state banks of seven great European nations thus leaving only £100,000,000 to be taken by other banks and to find its way into the circulation. As to prices, the index number based on 45 important commodities was 70 in 1888 and about 65 in 1898. The demonetization of silver must have had some influence in bringing about this state of things although it is in part explained by other causes. For instance, Russia has been storing large supplies of gold in order to obtain a basis for her inconvertible paper. This has been necessary for the establishment of a sound currency but it has tended to lower prices. The monometallists do not expect that this condition will last. They look to a cessation of the strain imposed upon gold by the extraordinary demand in Russia and they think that a rise in prices will follow. Nor do they fear any falling

off in the output of gold. The bimetallists, on the other hand, can see no solution of the problem except in the remonetization of silver.

In 1898 there was considerable discussion over the monetary condition in India. The reason which led the government to close the mints there in 1893 was that the fall of exchange constantly imposed a burden on the government. For years, the falling market value of silver had increased the financial strain upon the government by requiring constantly larger amounts for the payment of the sterling debt. As a result of this burden there were deficits between 1885 and 1893 which had to be made up by taxation. For a short time previous to 1893 the value of the rupee remained nearly stationary, but in 1893 the old downward movement began again and it was decided to close the mint to silver. Contrary to what would naturally be supposed there has not been a contraction of the rupees resulting from the stoppage of the coinage. But though the actual amount of rupee currency has not diminished, a great change has taken place in respect to its distribution. The famine and military operations of 1896 and 1897 caused a drain on the commercial centres since the government spent large amounts of money in these famine districts and on the frontiers. The removal of currency from the commercial districts led to a monetary stringency which showed itself by a great increase in the rate of discount. Prices, however, did not fall but on the contrary actually have risen since 1893. After the demonetization of silver the government of India declared that it would give rupees for gold at the rate of 16d. per rupee. Since that time, however, the rupee has never reached that figure, although in 1897-98 it was 15.385d. How far this increase in 1897-98 is due to the famine or frontier operations and the borrowing of money, all of which would tend to create a scarcity in the money market in India, is an unsettled question. One of the proposals before the Indian Currency Committee in 1898 was that of Sir Edgar Vincent who advocated measures which should adapt or adjust the treasury balances to the needs of the market in such a way as to relieve the stringency during the busy season and increase the money demanded during the slack season. See INDIA (Currency).

In January, 1898, Senator Wolcott made a statement in regard to the work of the International Bimetallic Conference Commission. It will be remembered that this commission was appointed by President McKinley in 1897 to enlist the coöperation of other countries in bringing about a new international monetary convention and to propose measures to foreign governments looking to a wider use of silver as money. Senator Wolcott's speech gives an outline of this work. The commission was most favorably received in France, whose government promised cordial coöperation if an international convention should be called. In Great Britain the commissioners attempted to secure some concessions in favor of silver and for a time it seemed as if they would be successful. In the summer of 1897 the governor of the Bank of England declared that the bank would hold one-fifth of the bullion in the issue department in silver. This aroused a good deal of alarm among the English gold monometallists, and the subject was discussed with much earnestness in the press. The general tone of the comment was adverse to the action of the governor of the bank but after events seemed to indicate that the ministry desired merely to call forth an expression of public opinion in order that they might have something upon which to base their reply to the request of the American commissioners. This request of the commissioners, however, was of far less importance than that concerning the status of silver in India. It was proposed that the Indian mints should be opened to silver and that the order making the sovereign the legal tender in India should be repealed. The British government would give no answer to any of the proposals made by the commission until it had conferred with the Indian government. The latter submitted its decision on September 16, 1897. As might have been expected it was a distinct refusal of the request.

Since this reply of the Indian government shows clearly its attitude toward the question of the standards at the present time a summary of its contents may be of current interest. It first compared the currency systems of France and the United States with that of India and showed that while the first two of these countries each had the gold standard, India was still in a transition state for the silver rupee was there the sole legal coin, although the government had undertaken to receive gold and sovereigns under certain restrictions, the rate of exchange adopted being 16d. per rupee or 15 rupees to the pound. When the transition period was passed it was probable that the Indian mints would be opened to gold and gold coins would be made legal tender to an unlimited amount, but silver rupees would also continue to be a legal tender as at present. The essence of the American proposals was that while France and the United States should open their mints to the free coinage of both gold and silver at the ratio of $15\frac{1}{2}$ to 1, India was to open hers to silver and keep them closed to gold, the latter coin not being made legal tender. Thus France and the United States would be bimetallic and India monometallic (silver). By this it was hoped that a stable ratio would be secured, but in this

hope the Indian government could not share. The first effect of this change would be in its opinion the stoppage of the Indian export trade on account of the sudden rise in the rate of exchange for it was expected that the rupee would rise in consequence from 16d. to about 23d. if the ratio $15\frac{1}{2}$ to 1 were adopted. A long period of prostration would follow on account of the lack of confidence on the part of the people and should confidence not be restored a reversion to the present policy would be necessary and would result in an enormous loss necessitating additional taxation. The Indian government held that such a proposal affected India far more seriously than it did either the United States or France since the risk of disaster would fall practically upon India alone. Both France and the United States had considerable stocks of gold and when the danger of depletion threatened, each country would probably take measures to check the outflow of the more precious metal. It was not probable that they would be restricted wholly to a silver basis and the Indian government believed that no great change would take place in their monetary condition. India would thus have to bear the entire cost of failure. "We do not think that any remedy would be open to us for if the Indian mints were reopened to silver now, it would, in our opinion, be practically impossible for the government of India to close them again; and even if they were closed it would only be after very large additions were made to the amount of silver in circulation." India had already passed through a period of severe distress and could not afford to take any hazardous risks. If a monetary union was to succeed in establishing a stability in the relative value of gold and silver it must consist of nations with a sufficient amount of metallic currency to exert a very powerful influence upon the relation of the standards. Great Britain must certainly be a party to such a union to insure its success. The Indian government could not believe that success would result if only France, the United States, and India entered into the arrangement. The fear was expressed that the whole stock of gold coin might disappear from France and the United States before they had succeeded in raising the market price of silver to the intended ratio with gold. At all events such a result was conceivable. Nor did it seem likely that either of these countries would refrain from preventive measures in the event of a large exportation of gold, and the adoption of such measures would of course be inconsistent with the proposals of the union and would impair its prospects of success. Finally in addition to these objections to the general principle of the proposals the Indian government took especial exception to the extraordinarily high ratio, namely $15\frac{1}{2}$ to 1, a ratio which it said it would oppose as injurious to the interests of India even if it were possible that it could be maintained.

The other proposals made by the commission to Great Britain were that the legal tender limit of silver should be raised to, say ten pounds, that 20 shilling notes based on silver should be issued and should be legal tender; that an agreement should be made to coin a certain amount of silver each year; that the Indian mints should be opened to the coinage of rupees and to the coinage of British dollars to be full legal tender in the Strait Settlements and other silver standard colonies; and that other steps should be taken to promote the coinage of silver in the colonies. The British ministry refused all these requests, but did so in the most courteous manner possible giving the commissioners to understand that the question might be reopened whenever they considered that new circumstances justified it. The director of the mint in his annual report for the fiscal year ending June 30, 1898, makes the following comments on the work of the Wolcott International Bimetallic Commission:

"The theory that a fixed ratio between gold and silver could be maintained by an international agreement is based upon the assumption, scarcely to be contested, that the monetary use of these metals is a factor of their value. If an agreement should be reached between nations to coin only at a certain ratio and one metal should rise even slightly above that ratio it would pass out of monetary use entirely. The cessation of that demand upon the dearer metal, the redoubling of it upon the cheaper, would tend to bring them together again.

A single nation acting alone is certain to lose the dearer metal entirely and retain only the cheaper as its standard. Thus, for any country under present conditions to open its mints to the unrestricted coinage of both gold and silver at 16 to 1 or any thereabout ratio would be for it to lose what gold it possessed, because that metal would surely go where it was rated higher.

If, however, there was no country in the world where it was legally rated higher there would be no place in which it might go for monetary use. Allowing that the ratio originally agreed to was approximately the market ratio, the valuation thus coinciding with the judgment of the commercial world, there seems every reason to believe that such an international agreement would accomplish its purpose.

Even though one metal should become established in a value above the legal ratio and become merchandise, the currencies of all countries would retain their fixed relations to each other. No shock or distress would ensue, no nation would be iso-

lated or sacrificed. They would be altogether on a common plain, with a common measure of value."

In Senator Wolcott's speech in the Senate on January 17, 1898, he referred to the surprise felt by the commissioners as well as by a great many people in England at the rejection by the Indian government of the offer of the United States and France to coöperate with it in measures for the rehabilitation of silver. It had been expected that the stringency in the money market, as described in a preceding paragraph, would induce the Indian government to look upon these proposals with favor. In 1898 the attitude of the Indian government toward this matter remained unchanged. It was generally thought there that even supposing it had been a mistake to close the mints to silver in 1893, the government was definitively bound to this policy. The work now before it was to bring the gold standard into effective operation. In May 1898, the government appointed a committee to investigate the monetary system of India. Its Chairman was Hon. Sir Henry H. Fowler, and among its members were Lord Balfour, Sir John Muir, Sir Francis Mowatt, and other prominent men. Various plans were proposed to relieve the monetary stringency in India. Among them is the suggestion that the London government shall contribute a loan of £20,000,000 to constitute a gold reserve fund. For an account of important currency changes in Russia, see the article RUSSIA (paragraph Currency).

BIOLOGICAL STATIONS. See ZOOLOGICAL STATIONS.

BIOLOGY. Each succeeding year seems to find biology taking a more and more prominent place among the sciences and 1898 has been no exception to the rule, for the amount of literature devoted to biological problems has been greater than ever before and at meetings of scientists the questions of biology have been among the foremost in their discussions. It is so hard to limit strictly the field of biology that investigators in other fields have often been trespassers on its borders. Usually they have come from the neighboring fields of chemistry or physics but more recently, in addition to these the mathematicians have entered on the scene.

Heredity.—The most notable work of these new-comers has been that of Professor Karl Pearsons, entitled *Mathematical Contributions to the Theory of Evolution*, which was presented before the Royal Society of London and has been abstracted in many scientific journals. During 1898, he has published two of these Contributions, the first one being entitled *On the Law of Ancestral Heredity* and the second, *On the Reconstruction of the Stature of Prehistoric Races*. In the former he attempts to formulate a "rounded mathematical theory" of heredity, which he bases on Galton's law of "Ancestral Heredity." According to this law "the two parents contribute one-fourth, the four grandparents one-eighth, the eight great-grandparents one-sixteenth, and so on, of the total heritage of the average offspring." Starting from this law, Professor Pearsons maintains that "the whole theory of heredity becomes simple, luminous, and well in accordance with such quantitative measurements as have so far been made." He believes further that it will be borne out by the facts that are yet to be discovered and that the law of Ancestral Heredity will then "play as important a part in the theory of evolution as the law of gravitation has in planetary theory." In his second paper, he has for his object "to illustrate the general theory by which we may reconstruct from the knowledge of one organ in a fossil or prehistoric race the dimensions of other organs, when the correlation between organs of existing races of the same species has been ascertained. The particular illustration chosen is the reconstruction of probable stature from the measurements of the long bones." A number of races are dealt with and the stature estimated for many, savage as well as civilized, prehistoric as well as mediaeval and modern.

Vitalism.—The most notable contribution of the year to the discussion regarding the origin of life has undoubtedly been the address delivered by Professor Japp before the chemical section of the British Association at Bristol last August, entitled *Stereochemistry and Vitalism*. In this extremely interesting paper, Professor Japp not only supports Pasteur's position that "no one has ever transformed an inactive compound into a single active compound, while nature is continually doing it," but he goes further and says "No fortuitous concourse of atoms, even with all eternity for them to clash and combine in, could compass this feat of the formation of the first optically active organic compound. Coincidence is excluded, and every purely mechanical explanation of the phenomenon must necessarily fail. I see no escape from the conclusion that at the moment when life first arose, a directive force came into play—a force of precisely the same character as that which enables the intelligent operator by the exercise of his will, to select one crystallized enantiomorph and reject its asymmetric opposite." In one passage, the expression "not even conceivably capable" was used of the incapacity of dead matter to perform the geometrical feat which living matter is constantly performing. The address has aroused a great deal of discussion and this phrase has been so vigorously attacked that

Professor Japp has acknowledged that under certain extremely hypothetical and improbable conditions dead matter could "conceivably" perform the feat, but this does not affect the validity of the general argument. Coming at a time when physiologists are so prone to consider life as nothing more than a combination of physical and chemical forces, this strong plea for a more careful consideration of the problem will add greatly to the interest in the discussion of the question *whether there is such a thing as vital force*. See also ZOOLOGICAL LITERATURE (paragraph General Biology).

BIRD PROTECTION. See ORNITHOLOGY (paragraph Organizations) also DISTRIBUTION OF ANIMALS (third paragraph).

BIRTH RATE. See PUBLIC HEALTH AND VITAL STATISTICS.

BISHOPS. See articles PROTESTANT EPISCOPAL CHURCH, METHODIST EPISCOPAL CHURCH, ROMAN CATHOLIC CHURCH, OLD CATHOLIC CHURCH, REFORMED EPISCOPAL CHURCH; ENGLAND, CHURCH OF.

BISMARCK-SCHOENHAUSEN, OTTO EDOUARD LEOPOLD, PRINCE VON. On July 31, 1898, both Europe and America were surprised to learn of the death of Prince Bismarck, which occurred the previous evening at his castle in Friedrichsruh. Since October, 1897, he had suffered many changes for the worse, never entirely regaining the strength lost; but on Thursday, July 28, he seemed to be something like his former self again; he drank and smoked, and seemed so well that his old friend and physician, Dr. Schweninger, felt justified in leaving Friedrichsruh. Being summoned two days later he returned only to find the old statesman beyond help. His improved condition had continued up to Saturday noon, July 30, when a sudden change was noticed, and he passed away at eleven o'clock, the cause of death being acute œdema of the lungs. Emperor William, who at the time was in Bergen, Norway, being immediately informed, emphasized in his telegram to Prince Herbert Bismarck the lifelong friendship for Bismarck of his "grandfather now at rest in God, his majesty the great emperor, and also the imperishable gratitude of the whole German nation for all time." "I shall prepare," he continued, "the last resting-place for his remains in Berlin, in the cathedral by the side of my predecessors." But the man whom the young emperor eight years before had offended so deeply had prepared against the demonstrations of a state funeral, having left a written paper directing that there be but little ceremony at his funeral, and designating a place for his mausoleum near the castle at Friedrichsruh. The treatment he received from William II, he never forgave; his wounded pride as well as his dislike of ostentation may be discerned in the following extract from one of his later letters: "I will at least take precautions in good time against mischievous pranks being played with my dead body. I should not like to furnish what the Berliners call a 'beautiful corpse' in one of those theatrical tragi-comedies, something between a village fair and a church procession. It would be about the only thing that now has any terrors for me." About 600 people witnessed the funeral; the Emperor and Empress were not present, but having visited Friedrichsruh on August 2d to attend the private religious service held in anticipation of the funeral, they had gone thence to Potsdam, where the Emperor issued a proclamation expressing sorrow and sympathy both on his part and on that of the nation. He seemed anxious, indeed, to express his regard for the dead statesman; in a letter to the present imperial Chancellor, Prince Hohenlohe, he said: "We who were witnesses of his splendid labors, who looked up to him in admiration as a master of statescraft, as a fearless fighter in war or peace, as a most devoted son of the fatherland, and a most faithful servant of his Emperor and King, are deeply affected by the death of the man whom God the Lord fashioned as the instrument to achieve the realization of his undying aspiration for Germany's unity and greatness." A special memorial service, attended by the royal family and by men of highest rank from all parts of the empire, was held Thursday, August 4th, at the Emperor William Memorial Chapel, and three days later another, organized by the Berlin Bismarck Committee, occurred in the new Royal Opera House. Bismarck wrote his own epitaph, which some one called a "posthumous snub" for William II; besides his name and the date of his birth and death, are the simple words, "a faithful German servant of Emperor William I." That Bismarck wrote this with any of his old bitter irony is a conclusion which, while it is possible, does not seem to be necessary.

The death of Bismarck called forth a large amount of discussion, but the conclusion was very general that in him the world had lost one of the greatest statesmen in history. This honor, however, some have said must be denied him because of his failure to make principles of strict integrity essential in founding a state.

They point out also that in his wars with Denmark in 1861, with Austria in 1866, and with France in 1870, he had no statesman or general of the first rank to oppose him, while supporting him was von Moltke with the greatest fighting machine that the world had ever seen. M. Edouard Drumont declared Bismarck to be a "blood-stained pirate," while other opponents censure him for what they deem the unwise



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annexation of Alsace and Lorraine, and for the present European *status quo* with its burdensome armed peace. On the other hand the *Neueste Nachrichten* proudly styled him "the creator of modern Germany;" and it may be fairly said that public opinion both in Europe and in the English-speaking world, is agreed with certain able critics who said "he shares the century with Napoleon," "he stands with the greatest of the nation makers, with Cromwell and Napoleon and Cæsar, far above such politicians as the Metternichs, Cavour, and Gladstones." Bismarck's greatness lay in his firm mental grasp of the "situation"—the political trend,—in the readiness with which he transposed thought into action, and in the innate vitality and inflexible will by which he bore his purpose to fulfillment. His two chief characteristics have been said to be this stubbornness of purpose together with a disregard of the kind of methods used in effecting it.

The purpose of Bismarck's life to which he gave his best energies was the amalgamation of the German states into the German Empire with Prussia at its head. So much was written in 1898 concerning this life-work of Bismarck that it may be well here briefly to touch upon a few of the more salient points. His plans were of slow, steady growth, but as early as 1848, he showed that power of extraordinary foresight and prudence which afterwards became such well-known characteristics. In 1850 he thought that the advancement of Prussia could be affected by closer affiliation with Austria. Soon discovering, however, Austria's purely selfish policy, he concluded that hegemony for Prussia in a German confederation must come through Prussian effort. He saw that the time was not ripe for union, that the interests of the states were too diverse for successful amalgamation. Bismarck, moreover, then and always, was a staunch royalist, distrusting popular government, and believing, at that time at least, in the "divine right," and on this account also he opposed in 1849 a united German empire with the king of Prussia at the head, for he scorned the idea that "a Hohenzollern might accept the imperial crown of Germany from the hands of the Frankfurt parliament as an adequate compensation for the curtailment of his prerogatives as king of Prussia. . . . It was for Prussia to impose and not accept constitutions." It was chiefly by his advice both in 1848 and in 1850 that the king of Prussia refused to become emperor. Bismarck was at this time a minister. He soon began to seek political supremacy for Prussia by increasing the strength and prestige of her army, but on every hand attempts were made to thwart his plans. Contrary to an opinion that has obtained until recently, William I was not a resolute man, but was constantly persuaded and encouraged by the tactful Bismarck. When the latter became president of the ministry, he scorned the Prussian parliament and used for the army whatever funds were needed whether regular appropriations were made or not. "If we find it necessary," he said, "to go to war, we shall do so with your approval or without." By tact and artifice and every other resource of his dominating personality, he finally persuaded the king and the ministry into an alliance with Italy. This further estranged Prussia from Austria, and the latter finally met with defeat at the hands of the Prussians at the battle of Sadowa (Königgrätz); and Prussia at last triumphant and supreme accepted the cession of Schleswig-Holstein, Hanover, Frankfurt, and Hesse-Cassel. This victory of Prussia at Sadowa in 1866, some one has said, "made him all-powerful with his master and all-powerful with the Prussian people."

But the complete triumph of Bismarck's will, the final expression of his constructive ability, was not yet realized. A Franco-German war was necessary to establish that community of interest and feeling by which alone a true and permanent amalgamation of the North German and South German states could be effected. That the magic touch of Bismarck precipitated this war and caused to spring into life upon its blood and ashes the strong new German Empire, is a well-known chapter of recent history. Not so well known, however, until very recently has been the story of Bismarck's stratagem in "doctoring" the famous Ems telegram which tricked the French into declaring war. Before his death Bismarck admitted the truth of this report, the facts of which are substantially as follows: King William, who with Heinrich Abeken was at Ems, did not meet the French representative, Count Vincent Benedetti, with what Bismarck considered sufficient dignity and hauteur in their interview concerning the future candidacy of a Hohenzollern for the throne of Spain. On learning this Bismarck telegraphed peremptorily from Berlin that if the king received Benedetti again, he requested his dismissal; receiving no answer, he telegraphed again, stating that if the king had received Benedetti, it was equivalent to an acceptance of his resignation. Upon this Abeken sent the famous telegram of about two hundred words, the tone of which was so wanting in decision that, if published, it would have averted a declaration of war on the part of the French. Bismarck held a consultation with Roon and von Moltke, and, being assured that the army was ready for action, he reduced the telegram to about twenty words, so choosing and ordering them that the spirit of the message was changed to one of defiance, insult, and almost aggression. The abbreviated telegram, having been sent to the various

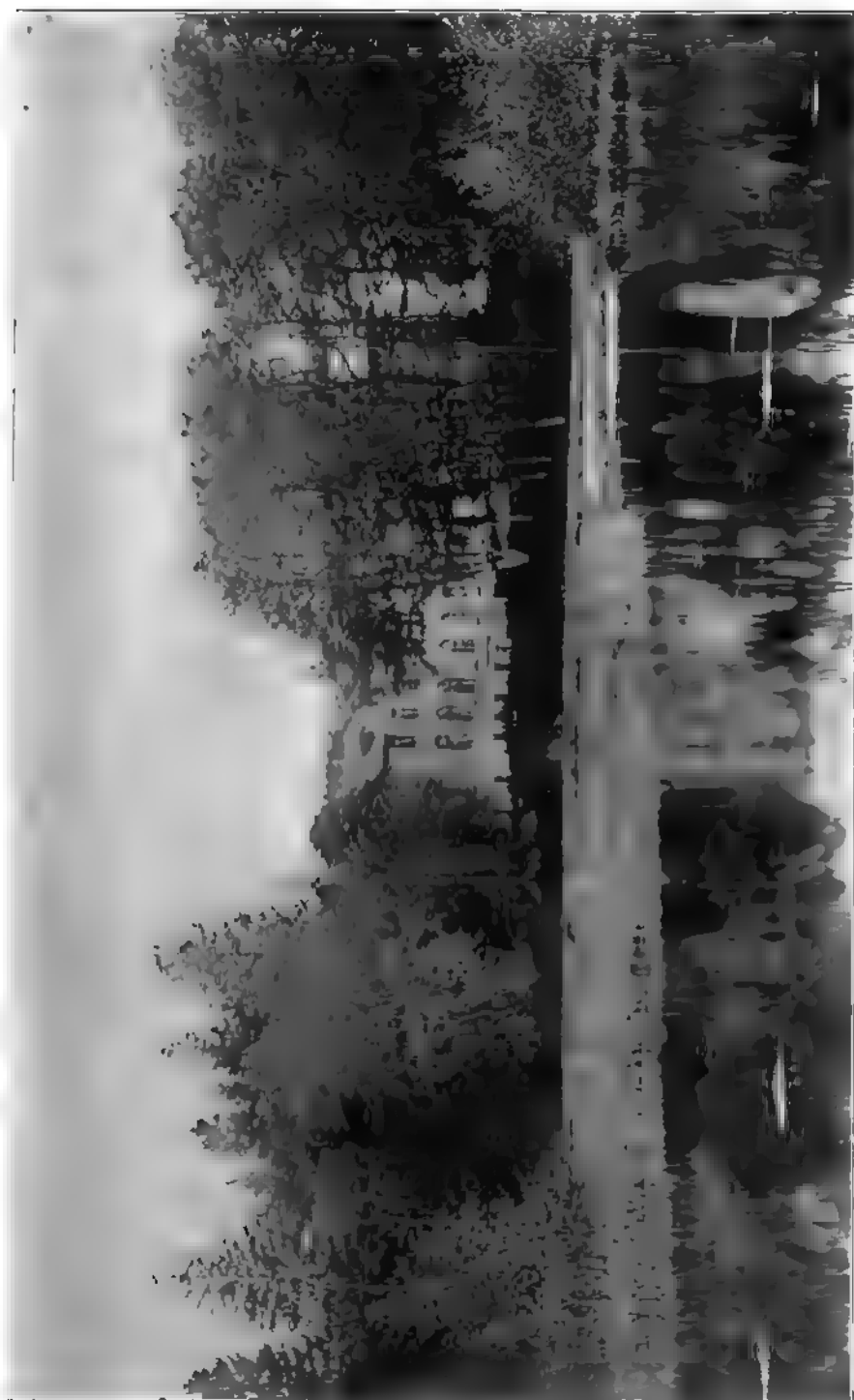
German embassies and published in the German papers, so incensed the French that, being ignorant of the close alliance which Bismarck had already effected between north and south Germany, in a few days they declared war. From the day of the coronation of the king of Prussia as the first German emperor "to the day of his dismissal, Bismarck was recognized as the ablest brain and the most masterful force in European politics." The mighty intellect, the unscrupulous methods, and the inflexible will had finally prevailed, and Germany arose a new creature.

Bismarck in his way was a pious man, being a firm believer not only in God and immortality, but in the idea that he was the instrument of God on earth. But he thought, or acted as if he thought, that his great object in seeking the advancement of the fatherland relieved him of scruples as to the manner of acting. Trickery, deception, and force he willingly used to effect his purposes, but he cannot be called base, for the accusation has not been made that he ever used unscrupulous methods for his personal benefit. In his public life—to use the expression of the ethicist—he minimized the importance of the *process* in considering the value of the expected *product*.

Bismarck had neither the broad knowledge, aside from politics and history, nor the thorough culture of his great contemporary Gladstone; but the world is quite agreed that the German excelled in constructive work and executive power. No man worthy of a hearing ever questioned the morality of one of Gladstone's public acts; but whatever the moralist may say of Bismarck, the chancellor's voice may still be heard triumphantly asserting that right or wrong he had the "saving virtue of success." He was not a great orator, yet his speeches were plain, clear, and forceful. He doubtless looked with some contempt on the more refined processes of rhetoric, and still he has left a large number of phrases and expressions that from their real suggestiveness and worth stick in the popular mind. Among them may be mentioned: "The majority has no heart;" "The more constitutional, the more expensive;" "Put Germany in the saddle and you will find it can ride" (*setzen wir Deutschland in den Sattel: es wird schon reiten können*); "Nach Canossa gehen wir nicht." "Do ut des."

The resignation of Bismarck in March 1890, from the offices of Prussian minister of foreign affairs, minister president, and imperial chancellor, started a discussion which has continued until the present time. The truth of the matter seems to be that the young emperor would not tolerate Bismarck's autocratic methods and at the same time differed essentially with him regarding both foreign and domestic policy. The immediate cause of rupture was the Berlin labor conference, which the emperor supported against the will of Bismarck. The trouble soon became so personal that the old statesman was forced to resign. While the public is not blind to the many able qualities of the emperor, still for accepting this resignation he has been greatly blamed. His dismissal was a bitter experience for Bismarck and Dr. Schweningen has stated that the old man called it his death-blow. The German Empire is his monument; all the world is asking, Will it abide? Since the advent of Prince Hohenlohe as chancellor, the policies of the "man of blood and iron" have suffered constant change, and meanwhile the mighty tide of German socialism is rising.

Busch's "Bismarck."—In the fall of 1898 Dr. Moritz Busch published his book entitled "*Bismarck, Some Secret Pages of His History. Being a Diary Kept by Moritz Busch During Twenty-Five Years' Official and Private Intercourse with the Great Chancellor.*" The book, which had been long expected, was favorably received as it threw much light not only on the private character of Prince Bismarck, but on many dark places in the political history of his time. The book is not, as Dr. Busch points out, either an autobiography or a biography of Bismarck. It is loose and unsystematic in its treatment, it aims at no one thing in particular, and is exactly what it is called, a diary of one man in which the words and actions of another are faithfully detailed. Throughout the work the character of the writer is subordinated and Bismarck is the all-powerful master spirit. Indeed, although the book is full of small talk and gossip, there are suggestions and revelations made which give one the impression of Bismarck guiding the events of his times like a god. Bismarck appears, as a critic has well said, more like a mighty force than a man. The notes for the book were taken and the book written with the full consent of the Chancellor, who wished that after he was dead the whole truth of his life should be revealed. And either we must believe that Bismarck was a very brave and candid man, or that his moral sense was too dull to perceive the shock that many of these revelations would give to the world, for the book seems to tell everything both good and bad. In it we see the mighty diplomat with his utilitarian standards his firm but crude religious beliefs, his entire lack of the aesthetic sense, his wit, his satire, and the vein of melancholy that on rare occasions made itself evident. The book emphasizes the feeling that has been increasing since his death that the man Bismarck was one of the greatest statesmen of all times, but that he also was one whose methods no self-respecting man could sanction. By this it is not



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implied that stratagem and trickery in warfare and diplomacy are immoral, but it is meant that the extent, or rather the depths, to which Prince Bismarck carried stratagem and trickery, as is shown in this work of his friend, is immoral not to say despicable. And yet, we must never forget the great game in which Prince Bismarck played, and the magnitude of the stakes; and when we see what he did for Germany it may be that we can, in part at least, forgive him his methods.

Dr. Busch was associated with Bismarck from about the time of the Franco-Prussian war until the end of the Chancellor's life. He was a political newspaper writer and through him Bismarck published many articles, which at the time were not known to have been written by the Chancellor, but which, politically were very effective. Not only did Bismarck write many political articles, but for years he seems to have been the editor-in-chief of the whole German press. It seems that through bribery, intimidation, or otherwise, Bismarck subordinated the leading German newspapers to himself and used them to bring about his own political ends. We believe that Bismarck did this for what he thought was the real good of Germany, but the principle of the thing has brought upon him scathing words of rebuke. As an instance of his plotting it may be said that at the outbreak of the Austro-German war the Chancellor proposed to the Austrian general, according to Dr. Busch, that they negotiate a peace, unite their forces, and attack France. The book shows many such plots, and it is interesting to learn into what seemingly strange courses the German people were frequently on the point of being led.

In these "secret pages" Dr. Busch shows us Bismarck's dislike for England, its statesmen and its queen; in it are traced his troubles with the Empress Frederick, his influence upon William I, and many other things of great historical significance. From the book one learns that while Bismarck loved the old Emperor, he had no great respect for his judgment or his ability, indeed, when on one occasion he said: "I lack altogether the bump of veneration for my fellowmen," he included the old Emperor with the others. And yet, notwithstanding the determined purpose, the almost conscienceless methods of the "man of blood and iron," there were times, writes Busch when he had softer moments. "There is no doubt," said Bismarck, "that I have caused unhappiness to great numbers. But for me three great wars would not have taken place, 80,000 men would not have been killed, and would not now be mourned by parents, brothers, sisters and widows.... I have settled that with God, however. But I have had little, if any, pleasure from all that I have done, while, on the other hand, I have had a great deal of worry, and anxiety, and trouble." But Bismarck was rarely found in this mood and we cannot but believe that he did enjoy the vast processes of unbuilding and building again to which he devoted his life. While these "secret pages" were greeted by Bismarck's enemies as furnishing proof of the worst things which they cared to say of him, and while with this end in view it was published in serial by the *Paris Matin*, nevertheless the friends of the old Chancellor, and the fair minded student of history, see in the book what seems to be a trustworthy picture of what Dr. Busch well nigh proves to have been the mightiest political character of our times. See GERMAN LITERATURE (paragraph Biography).

BISMARCK ARCHIPELAGO, several island groups in the Pacific ocean north of the eastern portion of New Guinea and including what was formerly known as the New Britain Archipelago, together with several adjacent groups. They have an area of about 20,000 square miles with a population estimated at 188,000. They were acquired by Germany in 1884, when it extended a protectorate over them and re-named them as above. The exports consist chiefly of copra and cocoanut fibre. The commerce is largely controlled by the German New Guinea Company. The imports are estimated at about 1,000,000 marks annually.

BISMUTH. The use of the sub-nitrate of this salt has been recommended for the preservation of cider. It is used in the ratio of 150 grains to 200 quarts. It serves the double purpose of not limiting the alcoholic fermentation to any appreciable extent and at the same time of preventing the formation of acetic acid.

BISPHAM, DAVID S., American baritone, born in Philadelphia, Pa., January 5, 1857. of a Quaker family. He cultivated his voice in Italy and England and achieved a reputation as an amateur. His début was made as the Duc de Longueville in *The Basoche*, Royal English opera, London, in 1891; since then he has frequently appeared in America. Mr. Bispham sings German, French, and Italian, but he has achieved most success in the Wagnerian rôles of "Alberich," "Kurwenal," "Telramund," and "Wolfram." He has a special gift for making interesting programmes and much musical taste. Mr. Bispham lives in London.

BLACK, WILLIAM, English novelist, died December 10, 1898. He was born in Glasgow in 1841; after studying art at a government school, he persuaded himself that he had little talent in this direction and turned to journalism, removing to London in 1864; his education was desultory, but he seems to have gained much from the influence of nature in long ramblings through the Western Highlands. In

London he became connected with the *Morning Star*, acting as special correspondent during the war between Austria and Prussia, in 1866; subsequently he became editor of the *London Review*, then of the *Examiner*, and finally assistant editor of the *Daily News*. His first novel, *Love or Marriage*, was published in 1867, but his reputation was made by *A Daughter of Heth*, which appeared four years later. In 1875 he definitely left journalism for literature. Mr. Black's works achieved a merited popularity. In them, may be found a fresh and healthy sentiment and a high appreciation of nature. "An industrious writer, he left a long line of stories of varying interest and quality. His touch was light, his fancy graceful, his sentiment fresh. He did not deal with problems; nor did he touch the deeper psychology of life. His death removes a genial and kindly figure from contemporary English literature." The following is a list of his works: *Love or Marriage*, 1867; *Daughter of Heth*, 1871; *Strange Adventures of a Phaeton*, 1872; *Princess of Thule*, 1873; *Maid of Killeena*, 1874; *Three Feathers*, 1875; *Lady Silverdale's Sweetheart*, 1876; *Madcap Violet*, 1876; *Green Pastures and Picadilly*, 1877; *Macleod of Dare*, 1878; *White Wings*, 1880; *Sunrise*, 1881; *The Beautiful Wretch*, 1881; *Adventures in Thule*, 1883; *Yolande*, 1883; *Shandon Bells*, 1883; *Judith Shakespeare*, 1884; *White Heather*, 1885; *Wise Woman of Inverness*, 1885; *Sabina Zembra*, 1887; *Strange Adventures of a Houseboat*, 1888; *In Far Lochaber*, 1888; *Penance of John Logan*, 1889; *The New Prince Furtunatus*; *Stand Fast*, *Craig Royston*, 1890; *Donald Ross of Heimra*, 1891; *Wolfenberg*, 1892; *Magic Ink, and Other Tales*, 1893; *Handsome Humes*, 1893; *Highland Cousins*, 1894; *Briseis*, 1896.

BLANDIN, JOHN J., Lieutenant, U. S. N., officer of watch on the battleship *Maine* when that vessel was blown up in Havana harbor, February 15, 1898; died at Baltimore, Maryland, July 16, 1898. He was born in 1863; was graduated from the Naval Academy at Annapolis in 1882, and was aboard the *Trenton* at Apia, Samoa, in the hurricane of March, 1889.

BLEPHAROPLAST. See BOTANY (paragraphs Centrosomes and Blepharoplasts, Cytology, Spermatozoids in Gymnosperms).

BLIND, EDUCATION OF. See EDUCATION.

BLISS, CORNELIUS NEWTON, Secretary of the Interior in the McKinley cabinet, was born at Fall River, Massachusetts, January 26, 1833. He received his education at the public schools and academy of Fall River and at the high school in New Orleans. After leaving school he was for a year in the counting room of his stepfather in New Orleans, and then went to Boston where he was clerk in the firm of I. M. Beebe, Wright & Co. He became a partner in the Boston commission house J. S. and E. Wright & Co., in 1866. He afterwards went to New York to manage the business interests of the firm in that city, and in 1881 the house became Bliss, Fabyan & Co. Mr. Bliss became prominent in Republican politics in 1860. He was a member of the Pan-American conference; chairman of the Republican New York State committees, 1887 and 1888; treasurer of the national Republican committees in the campaign of 1892 and 1896. All other public office he declined. He was chairman of the business men's committee which sought to secure a second term nomination for President Arthur in 1884, and in 1893 was chairman of the "Committee of Thirty." On March 5, 1897, he was appointed and confirmed Secretary of the Interior in President McKinley's cabinet. He has been a strong opponent of Mr. T. C. Platt and the Republican machine in New York. In December 1898, Mr. Bliss resigned his portfolio. His successor is Mr. Ethan Allen Hitchcock, of Missouri, ex-Ambassador to Russia.

BLUESTONE. See BUILDING STONES.

B'NAI B'RITH, IMPROVED ORDER, a fraternal society, founded in 1887, with one supreme lodge, 35 subordinate lodges, and 3,472 members. Since its organization it has disbursed \$133,000 (endowments only) and \$24,000 the last fiscal year. Joel M. Marx, New York, supreme president; Rudolph Sachs, Baltimore, first vice-president; Sol. S. Schloss, Baltimore, second vice president; Leopold Braun, Baltimore, secretary; and Kaufman Katz, Baltimore, treasurer.

B'NAI B'RITH, INDEPENDENT ORDER OF, a fraternal organization founded in 1843. It has 10 grand lodges, 454 subordinate lodges, and 31,750 members. Altogether it has disbursed \$39,250,000, and \$1,243,000 during the last fiscal year. Julius Bien, New York, president; Simon Wolf, Washington, vice-president; Solomon Sulzberger, New York, secretary; and Jacob Furth, St. Louis, treasurer.

BOARDS OF HEALTH. See PUBLIC HEALTH; SANITARY LEGISLATION; SEWAGE PURIFICATION; and WATER PURIFICATION.

BOAT-RACING. At Henley in England the single scull race at the Henley Regatta was won by an American registered from Trinity Hall, Cambridge, England. In the United States the triangular race between Harvard, Yale and Cor-

nell Universities was held at New London, Conn., on June 23. The Cornell crew won easily, leaving the Yale crew 4 boat lengths behind and the Harvard crew, which was behind from the start, still farther in the rear. The race between the Freshmen crews was more interesting because more closely matched. Yale came out ahead with Harvard second and Cornell third. Cornell, which had been victorious at New London, was defeated by the University of Pennsylvania at Saratoga on July 2, Wisconsin and Columbia coming in third and fourth. The Cornell Freshmen crew won in the Freshmen race. The annual boat-race between Oxford and Cambridge was held at Putney on March 26, resulting in a victory for Oxford.

BOERS. See TRANSVAAL.

BOHEMIA, is a province of Austria with an area of 20,060 square miles and a population on December 31, 1890, of 5,843,094, of whom about two-thirds were Czechs and one-third Germans. It has a Provincial Diet which is competent to legislate on all matters not expressly under the jurisdiction of the *Reichsrath* and which consists of a single assembly. It is one of the most productive provinces of the Austro-Hungarian Empire and its trade is important. The United States Consular Report, dated January 12, 1898, gives the declared value of exports from the district of Prague in Bohemia to the United States as \$407,483 for the quarter ending December 31, 1897, as against \$446,100 for the quarter just preceding. The falling off is chiefly due to the cessation of the exportation of sugar. The sugar industry in Bohemia is one of the chief sources of wealth. At the beginning of 1898 there were 112 raw sugar factories, twelve factories with refineries and nine refineries in operation. The Austrian government pays a bonus to the producer and thus stimulates the industry. The chief market for sugar is England, which is said to take about 80 per cent., the rest going to Canada, India, China, Japan, and the Argentine Republic. The reason assigned for the cessation of the export of sugar to the United States was that the dealers had shipped a large surplus to this country just before the passage of the new United States tariff act, and had thus overstocked the market. The exports from the district of Prague, in Bohemia, to the United States continued to show a falling off during the first quarter of the year 1898, and this was no longer attributed to the sugar industry but to the tariff since those articles which showed the decrease were chiefly wool, hops, potash and dress goods.

Political Situation.—For thirty years Bohemia has been striving for more complete local independence. She has aimed to secure for herself such a position of virtual independence as Hungary obtained in 1867. Recently racial differences have thrown the province into confusion. The young Czech party has become more prominent and aggressive and the quarrel over the language question was very bitter in Bohemia during 1897-8. The Czechs demanded that the Bohemian tongue should be put on an equal footing with the German. The Bohemian party was strong enough in the *Reichsrath* to make the ministry dependent on it for its continuance. Count Badeni, the Premier, at last issued the famous language decrees demanding that government officials in Bohemia should learn to speak Bohemian and that the latter tongue should be used concurrently with German. This measure provoked the German element in the population to violent action. The antagonism was most apparent in the matters of education for in districts where the one element predominated it refused to allow the language of the other to be taught in the schools. It is provided by law that the language of instruction shall be that which prevails in the district. The fanatical spirit ran so high that each party did its best to prevent the language of the other from being taught or spoken. In Prague, for instance, German almost ceased for a time to be spoken and the German inscriptions on monuments were effaced. Race animosity became so bitter that German employers discharged their Czech laborers in great numbers and Czech shop-keepers refused to serve German customers. Each party was to blame but of the two the Germans were the more aggressive, having, as they thought, more to gain by agitation. For a further account of the race controversy, especially in regard to the disgraceful scenes to which it led in the *Reichsrath*, see the article AUSTRIA-HUNGARY.

BOISDEFFRE, LE MOUTON DE, the chief of the staff of the French army during the Dreyfus agitation. (See FRANCE, paragraphs on History.) He was born in 1839; studied at St. Cyr; served in the Franco-German War; became general of division in 1892, and chief of the general staff in 1894. He appeared in court in full uniform toward the close of the Zola trial, and declared in confirmation of the statement made by Gen. de Pellieux in regard to the existence of a third secret document, that there was such a document, and that it proved beyond a doubt the guilt of the convicted captain. His address to the jury was greeted with loud applause, and the angry criticism by Zola's counsel, M. Labori, caused an uproar in the court. Labori declared that generals of the army were coming into court in full uniform in order to influence the decision, and complained that while they were allowed to harangue the jury against revision, the defense was checked and thwarted in every way. The

document referred to by Gen. Boisdeffre was the third letter which was supposed to have passed between the German and Italian attachés, but which the confession of Lieutenant-Colonel Henry proved to be a forgery. After Henry's death, Gen. de Boisdeffre resigned, saying that he had mistakenly placed confidence in Lieutenant-Colonel Henry, and had believed as genuine what was proved to be forged evidence.

BOKHARA, is a tributary state of Russia lying in Central Asia to the south of the Russian province of Turkistan and to the north of Afghanistan. It is ruled over by an Ameer (Sayid Abdul Ahad in 1898). Among its products are cotton, corn, fruit, tobacco, silk, and hemp, and the raising of live stock is important. It is traversed by the Russian Trans-Caucasian railway which passes near the capital, Bokhara, and a telegraph line connects the latter city with Samarkand. Russian officers give military instruction in the army which the Ameer is allowed to retain for administrative purposes and which numbers about 20,000, and there is a Russian Political Resident at the court. The population is about 2,500,000 and the area 92,000 square miles. Bokhara, the capital, has about 100,000 inhabitants.

BOLIVIA, one of the two interior republics of South America, consists of nine departments, whose area aggregates about 567,360 square miles, and whose total population is estimated at 2,019,549. The aboriginal Indians number about 1,000,000, the mestizos (races of Spanish and Indian blood), and the whites, each 500,000. La Paz de Ayacucho is the department of greatest area (171,200 square miles) and of greatest population (593,779); the smallest department is Oruro (21,331 square miles), and the least populous, Beni (26,750); Cochabamba is the most densely populated (area, 21,417; population 360,220). The Litoral department on the coast is mortgaged to Chile, but Bolivia is guaranteed the privileges of a port. Sucre, the seat of government since 1894, has about 20,000 inhabitants; La Paz, the capital in 1893, has 40,000; Oruro, the capital in 1892, 15,000; the other more important towns are: Cochabamba, 25,000; Potosi, 20,000; Tarija, 10,000; Santa Cruz, 10,000.

Government.—According to the present constitution, the chief executive authority is a President, who is elected by popular vote for a term of four years, and who is ineligible for reelection. He is assisted by a ministry of five departments designated as follows: Government and Colonization; Foreign Relations and Worship; Finance and Industry; War; Justice and Public Instruction. The President in 1898 was Señor Don Severo Fernandez Alonso, who was inaugurated August 15, 1896. The legislative power is vested in a Congress consisting of a Senate and a Chamber of Deputies. Members of the former number 18 and are elected for six years, and of the latter 64 and are elected for four years. Legal voters are only those who can read and write. The departments which are administered by prefects, are divided into 52 provinces and 374 cantons, administered respectively by sub-prefects and corregidores. The capital of each province has a municipal council. Besides local justices there are eight District Courts and the Supreme Court.

Finance.—The estimated revenues and expenditures in bolivianos for fiscal years have been:

	1894.	1895.	1896.
Revenue	5,234,820	5,670,790	6,305,793
Expenditure	5,721,300	6,077,264	6,727,824
		1897.	1898.
Revenue		6,963,124	.....
Expenditure		6,785,596	5,714,793

It should be noted, however, that subsequent changes were made in some of these estimates; the revenue for 1894 was later officially stated in bolivianos at 3,566,777, and the expenditure at 4,264,681; in 1897 the revenue for 1895 was estimated to have been 4,115,700. In the fall of 1898 Señor Guiterrez reported that the national revenue in 1897 was 4,840,300 of which 2,691,722 were derived from customs. He reported that according to the budget of 1898 the amount to be expended was 5,714,793; of this amount 1,817,489 was for instruction and public works, 1,571,482 for the finance department, and 1,519,218 for the war department. The provincial revenue, which is used in maintaining the provincial government and for local improvements was about 600,000. The external debt, due to Chilean creditors, was originally 6,500,000 bolivianos; at the close of the fiscal year 1897, 5,415,445 had been paid, leaving the debt at 1,084,555. Señor Guiterrez reported the internal debt at 3,707,541 bolivianos; in 1895 it was 3,614,340.

Army.—The peace footing numbers 1,500 men; the national guard comprises all male citizens between 21 and 40 years of age.

Industries and Commerce.—Although the table-lands of Bolivia are among the highest inhabited portions of the earth's surface, large areas are well adapted for

the cultivation of many tropical and sub-tropical products, but agriculture, nevertheless, is in a very unprogressive state, and manufactures of any considerable importance are almost unknown. On account of the absence of a statistical office in the country it is impossible to secure accurate commercial data. The exports include silver, hides, and skins, copper, wool, cacao, cinchona, coffee, gold, and rubber, the last named article affording one of the most important industries of the country. The production of cereals, beans, potatoes, etc., is only sufficient for domestic wants, and sugar, which may be grown very successfully, is largely imported from Peru. The greater part of the Bolivian sugar cane is used for distillation. The country is rich in forests, grazing lands, and in minerals, including silver, copper, tin, bismuth, antimony, gold, and borax. The output of silver in 1894 was 14,519,296 ounces; during the next two years there was a considerable falling off, but the output for 1897, was about 15,000,000 ounces, placing Bolivia fourth among the silver-producing countries of the world. The most important silver district is Huanchaca. Tin is the next metal in importance, the annual export of concentrated ore being about 4,000 tons. The annual export of copper is about 3,000 tons. Gold is found in small quantities, but is produced only from placer diggings of the Indians: the output in 1897 was valued at \$750,000. The government seeks to promote valuable industries by liberal concessions. The chief imports are hardware, cotton, woolen, and linen goods, ready made clothing, provisions, and alcoholic liquors; this trade is largely controlled by Germans. The ports through which Bolivian commerce passes are Mollendo (Peru), Arica and Antofagasta (Chile), and Villa Bella and Puerto Suarez (eastern river ports). The imports for 1894 have been estimated at 6,800,000 bolivianos, and the exports at about 28,442,000.

Communications.—As in most South American countries, internal communication is difficult. There is one railroad, which, running from Antofagasta to the Bolivian border at Ascotan, continues to Uyuni; from the latter point a branch extends to Huanchaca and Oruro, the total length in Bolivian territory being about 500 miles. Other railways have been proposed, concessions have been granted, and in 1898 the routes were being surveyed. The following are among the proposed roads: Santa Cruz to the Paraguay river; Oruro to Cochabamba; LaPaz to the Peruvian border; Chollapata to Potosi; and a line into Argentina. Improvements have been recently made by the construction of new wagon roads and suspension bridges. In 1897, the Bolivian telegraph lines, connecting Argentina with the Pacific coast, together with a number of interior branches, aggregated 2,980 miles in length. The total length of telegraph lines is 2,980 miles; number of offices 68. Bolivia belongs to the postal union and has 156 post offices.

Religion and Education.—The Roman Catholic is the state religion, but other faiths are tolerated. Elementary instruction is gratuitous and nominally compulsory. The following statistics are reported for 1896: Primary schools, 506, having about 800 teachers and about 32,800 pupils; colleges and secondary schools, 16, having 104 professors and 2,139 pupils; universities 6, having 100 professors (law, medicine, theology) and 1,900 students; 70 schools for Indians; 34 mission stations; 160 other schools; a military school having 9 professors and 60 students.

Money.—Bolivia has two commercial banks of issue, the one having a paid-up capital of 3,000,000 bolivianos and the other 2,000,000. There are also three mortgage banks each with a paid-up capital of 100,000 bolivianos. According to the quarterly estimate made by the Director of the United States mint on October 1, 1898, the boliviano was worth in United States gold \$0.436.

Events of 1898.—Late in the summer of 1898 a boundary commission under the leadership of Col. Muñoz, who was said to be one of the most prominent Bolivian statesmen, and Señor Reyes, an efficient engineer, proceeded from Sucre to La Quiaca for the purpose of making topographical observations and anticipatory to the settlement of a boundary dispute with Argentina. In the autumn internal affairs were disturbed by an electoral campaign which seemed to threaten a revolution.

BONAPARTE, NAPOLEON. See FRENCH LITERATURE (paragraph History).

BOND, SIR EDWARD AUGUSTUS, K. C. B., LL. D., F. S. A., sometime principal librarian of the British Museum, died January 4, 1898. He was born December 31, 1815, and was educated at the Merchant Taylors' School. He became in 1838 assistant in the Manuscript Department of the British Museum, keeper of the department in 1866, and was principal librarian from 1878 to 1888. He published: *Statutes of the Colleges of Oxford*, 3 volumes, 1853; *Speeches in the Trial of Warren Hastings*, 4 volumes, 1859-61; *Chronica Monasterii de Melsa*, 3 volumes, 1866-68, Master of the Rolls Series; Fletcher's *Russe Commonwealth*, and Jerome Horsey's *Travels*, for the Hakluyt Society; *Facsimiles of Ancient Manuscripts*, published by the Palaeographical Society, 5 volumes, 1873-88.

BORAX AND BORIC ACID. There was an increased production of borax during the past year, and California continued to be the chief source of supply although

some came from Oregon and Nevada. Since so many of the widely used food products of the present day are preserved by means of these salts, Prof. Chittenden of Yale has undertaken the analysis of their effects on the human system. He experimented on dogs with the view of finding out the effects on their nutrition. The results clearly indicate that moderate amounts of borax are not harmful to the nutrition of the dog's body and probably do no harm when taken into the human body. Dogs weighing 20 to 25 pounds are apparently not affected by daily doses of from $\frac{1}{2}$ to $1\frac{1}{2}$ teaspoonfuls when mixed with their daily food. With larger doses however, poisoning may follow. If either borax or boric acid in amounts of from 1.5 to 2 per cent. of the daily food are taken, nausea and vomiting are apt to result. Both boric acid and borax are without effect on intestinal putrefaction. This is probably due to the rapid absorption from the gastro-intestinal tract, and its quick elimination by the kidneys.

BORNEO is a large island in the Malay Archipelago about 800 miles long and 600 broad, with an area of about 300,000 square miles. The greater part of its territory is under British or Dutch protectorates. The British sphere includes British North Borneo in the northern part of the island and the neighboring territories of Brunei and Sarawak on the northwest coast. **BRITISH NORTH BORNEO** is under the jurisdiction of the British North Borneo Company, but in May 1888, the British government declared a formal protectorate over it and the appointment of the governor must receive the approval of the Secretary of State. The Company sells or leases its lands to planters, whose principal crops are tobacco and coffee. It is a self-supporting colony and has no public debt. Its trade is chiefly through Singapore with Great Britain and the colonies. Among its principal products are timber, sago, rice, gums, coffee, pepper, gambier, gutta percha, tapioca, sweet potatoes and tobacco. A small native military force is maintained for administrative purposes under European officers. **BRUNEI** is also under a British protectorate, the internal administration being left to the Sultan. **SARAWAK**, with an area of about 50,000 square miles has been under English influence since 1842 when Sir James Brooke obtained the government. Under him and his son and successor Sir Charles Johnson Brooke, the colony has flourished. There is a considerable trade in timber and its products are like those of North Borneo. The territories on the coast with an estimated area of 212,737 square miles and an estimated population at the end of 1895 of 1,180,578, are claimed by the Dutch whose principal settlements are at Banjarmassin, Pontiana, Sambas, and Koti. The colony of Labuan is under the control of the British North Borneo Company. The native state of Sulu lies between British North Borneo and the Dutch territories on the East.

BORNU is a state in the Central Soudan with an estimated area of 50,000 square miles and an estimated population of over 5,000,000 comprising chiefly people of mixed negro descent, Tuaregs, and Arabs. The country is one of the most populous of the Mohammedan states in Africa. It is ruled over by a Sultan who is aided in the administration by a council of military chiefs and has a standing army of 30,000. Its capital, Kuka, lies on the west side of Lake Tchad and is an important commercial centre with a population estimated at between 50,000 and 60,000. The Anglo-French agreement excluded Bornu from the French and German spheres of influence.

BORON. The atomic weight of this element has been recently redetermined by F. B. Armitage. As a mean of several experiments, the number chosen is 10.959. Professor Ramsay's number is 10.966.

BOSNIA AND HERZEGOVINA are two Turkish provinces which lie south of the Danube, having Servia on the east and Dalmatia on the west. By the treaty of Berlin in 1878, Austria was authorized to occupy and administer them. Their combined area, including the sanjak of Novi-Bazar, is 23,571 square miles, and their population in 1895 was 1,568,092, of whom 548,632 were Mohammedans, 673,246 belonged to the Oriental Orthodox Church and 334,142 were Roman Catholics. It was estimated in 1895 that 88 per cent. of the population were occupied in agriculture, which, however, is carried on by primitive methods. The soil is fertile and produces among other crops wheat, maize, barley, oats, rice, millet, buckwheat, potatoes, flax and hemp. Tobacco is an important crop in Herzegovina and some wine is also produced in that province. In both provinces fruit is raised in abundance. The natural resources of the provinces are said to be considerable. Minerals abound but mining is mainly conducted by the government. A good many of the inhabitants are engaged in the raising of cattle, goats, sheep, swine and horses. Silk culture and the production of beet sugar are carried on to some extent. It is said that about 45 per cent. of the land is covered with forests. The native military force numbers 5,185 and the Austro-Hungarian army of occupation is about 23,000 strong. The imperial government of Austria-Hungary directs the administration of the provinces through the Bosnian Bureau, at the head of which is the Imperial Minister of Finance at Vienna. The seat of the provincial government is at Sarajevo and con-

sists of three departments, namely for finance, internal affairs, and justice. The local executive bodies are aided in the government by an advisory board consisting of the prelates of Sarajevo and twelve representatives of the people. Recent writers have declared that the internal condition of the provinces has greatly improved under the Austrian rule and a large number of the people have been brought to favor annexation to Austria, although there are still evidences of Panslavist sympathies.

BOSTON. See MASSACHUSETTS.

BOTANICAL GARDENS. See BOTANY (paragraph Botanical Gardens).

BOTANICAL SOCIETY OF AMERICA. See BOTANY (paragraph Botanical Societies).

BOTANY. The purpose of the present article is to describe some of the more important features of the progress of the science of botany during the year 1898.

Spermatozoids in Gymnosperms.—In the latter part of the year 1896 and in the beginning of the year 1897 was announced a discovery which, in its bearings upon our knowledge of the inter-relationships of plants, was as full of significance and interest as any that has been made during the last half century. This was the discovery that fertilization in two of the lower seed-plants is effected through the agency of motile spermatozoids essentially as in the higher cryptogams. The credit of this important advance in our knowledge belongs to two Japanese botanists of the Imperial University at Tokio, namely, Dr. S. Hirase, who detected motile spermatozoids in *Ginkgo biloba* and Professor S. Ikeno, who found similar bodies in *Cycas revoluta*. This was soon followed by the discovery of motile spermatozoids in a second cycad, *Zamia integrifolia*, by an American, Mr. H. J. Webber. These notable discoveries bridged over what had been up to that time one of the most important gaps between the gymnosperms and the higher cryptogams, for it had been held that the former, without exception, were *siphonogamous*, i. e. that fertilization was accomplished by means of a non-motile male cell which was brought into contact with the egg by the protrusion of a tube from the pollen-grain and its subsequent growth in the female apparatus; while the higher cryptogams, on the contrary, were *zooidiogamous*, i. e., fertilization was accomplished by a self-motile male cell, the spermatozoid. But *Ginkgo*, *Cycas*, and *Zamia* develop both motile male cells and pollen-tubes, and so are *zooidiogamous* and in a sense *siphonogamous* at one and the same time. Thus has vanished another of the seemingly hard and fast lines in organic nature.

The year 1898 has witnessed the publication of important papers by Hirase and by Ikeno, embodying the detailed results of their investigations upon the development of the sexual organs and the process of fertilization in *Ginkgo* and *Cycas*. The observations of Ikeno upon spermatogenesis in *Cycas* may be summarized as follows: The pollen-grain at maturity consists of two small "prothallium cells" and a large "embryonal cell." Shortly after pollination the grain sends out a tube which penetrates the nucellar tissues of the ovule and into this tube migrates the nucleus of the embryonal cell, while the two prothallium cells maintain their original position. In the course of about a month, the nucleus of the inner of the two prothallium cells, which has increased in size, divides into two; one of these is extruded toward the outer prothallium cell and perhaps corresponds to the stalk of an antheridium; the other, the "body cell" or generative cell, probably homologous with the "central cell" of an antheridium, enlarges and in it appear two bodies which Ikeno, Hirase, and Guignard call centrosomes, but which Webber, believing them to be essentially different from true centrosomes, has named "blepharoplasts." These blepharoplasts first appear in the cytoplasm at opposite poles of the nucleus and in immediate contact with its periphery; they afterward become separated from the nucleus and increase in size until they attain a diameter of 10-15 micromillimeters, finally taking a position such that the line joining them is at right angles to the long axis of the pollen tube. In about another month from the time of origin of this body cell, it divides into two hemispherical daughter-cells, the *spermatids*. The blepharoplast of each spermatid becomes now transformed into a mass of granules which afterwards dispose themselves in a narrow band, and the cell-nucleus sends out a small beak-like process by means of which it comes into intimate contact with this band. The band, remaining attached by one of its ends to the nuclear process elongates and makes five spiral turns in the cytoplasm of the spermatid just within its periphery, and from this band spring very numerous cilia which at first lie in the cytoplasm but later protrude freely from the surface. After a time, the connection between the blepharoplast band and the nucleus vanishes. The matured spermatozoid consists of a large nucleus completely surrounded by a cytoplasmic mantle, which in the anterior half is thrown into a helicoid spiral ridge having four or five turns, the corresponding spiral furrow being occupied by the ciliiferous band; a section shows that the surface of the nucleus itself has ridges and furrows exactly corresponding to those of the cytoplasm. The

tully ripened spermatozoid has a tail-like process of about the length of its body. The tail is evidently a prolongation of the posterior portion of the cytoplasmic mantle. Ikeno was not so fortunate as to see the spermatozoids in a living moving condition. Their movements have, however, been observed by Hirase in *Ginkgo* and by Webber in *Zamia*. Webber was able to keep those of *Zamia* in motion in a sugar solution for periods varying usually from thirty minutes to sixty minutes,—in one case, even for two hours and forty-four minutes. A tail is present in the spermatozoids of *Ginkgo*, developed, according to Hirase, at the moment of their breaking forth from the pollen-tube, but no such appendage was found by Webber in those of *Zamia*. The tail of the spermatozoids of *Ginkgo* and *Cycas* is not to be homologized with that of the spermatozoa of animals. The spermatozoids of these gymnosperms are much larger than any motile male cells known elsewhere in either the vegetable or animal kingdoms and on this account they lend themselves well to the study of development in details which are not easily followed out in smaller cells. The living spermatozoids of *Zamia* are visible to the unaided eye, being, according to Webber, 258-332 μ in length by 258-306 μ in width; those of *Cycas* (seen only in material treated with reagents) are considerably smaller, being described by Ikeno as 160 μ long (one half of which is occupied by the tail) and 70 μ broad. In *Cycas*, on the penetration of the egg-cell by the spermatozoid, the sperm-nucleus slips out from its cytoplasmic mantle which soon disorganizes within the egg while the nucleus proceeds toward the egg-nucleus, which by this time exhibits a crater-like depression for its reception. The sperm-nucleus comes in contact with the egg-nucleus at this depression and presses deeper and deeper into the egg-nucleus until its entire body lies within the latter. Then the sperm-nucleus loses its membrane and fuses with the nuclear substance of the egg. This penetration of the egg-nucleus by the unchanged sperm-nucleus appeared to Ikeno to be a phenomenon not elsewhere observed in either the animal or vegetable kingdoms, though the discovery of a similar procedure in *Onoclea* and *Marsilia* had been announced by Shaw two or three months previously. It is stated by Ikeno that by reason of the extraordinary size of the sexual nuclei of *Cycas* certain of the stages in their conjugation can be perceived with the naked eye by the use of transmitted light upon sections permanently mounted in the ordinary way.

Centrosomes and Blepharoplasts.—Recent investigations upon plant spermatozoids, notably those of Belajeff in the Equisetineae, Filicineae and Characeae, Hirase in *Ginkgo*, Ikeno in *Cycas*, Webber in *Zamia*, and Shaw in *Onoclea* and *Marsilia*, have added much not only to our knowledge of the structure and development of the spermatozoids themselves, but have also brought out many facts bearing upon the vexed question as to the nature and function of the *centrosome*. It is now generally agreed that the body of the spermatozoid is formed of both nucleus and cytoplasm and that there is present in the spermatid a definite organ, variously known as Nebenkern, Körperchen, attraction-sphere, centrosome, blepharoplast, etc., which plays an active part in the formation of the cilia. The behavior of this body is, in general, much the same in all the forms studied, though differing in certain details. The blepharoplasts of *Zamia* are the largest yet discovered, attaining at their maximum a diameter of 18-20 μ . Their history and development as described by Webber in his various papers may be outlined as follows. The two blepharoplasts arise *de novo* in the cytoplasm of the generative cell. They appear first as minute bodies at opposite ends of the nucleus just outside the nuclear membrane. They are spherical and stain deep red with safranin in the Flemming triple stain process, are homogeneous in structure or sometimes contain a few very small vacuoles. At first but a few kinoplasmic filaments radiate from them but later these become abundant, the blepharoplasts at the same time increasing in size. The threads of kinoplasm are rather coarse and are plainly visible even without staining. Many of these extend quite to the *Hautschicht* of the cell and appear to unite with it; others may be seen to run to the nuclear wall. By this time the blepharoplast shows a clearly differentiated outer membrane. When the nuclear spindle is formed, the blepharoplasts always take a position in the cytoplasm directly opposite the polar ends, though the spindle fibers appear to be wholly within the still intact nuclear membrane and the kinoplasmic radiations, so conspicuous about the blepharoplast in the resting condition, have now entirely disappeared. It would therefore appear that there is no direct physical connection between these bodies and the nuclear spindle, though their peculiar and constant relations suggest that the blepharoplasts either determine the position of the nuclear spindle or *vice versa*. In an early anaphase of the cell division, the vacuolated contents of the blepharoplast begin to draw away from its bounding membrane, which meanwhile increases in size. When the metaphase stage has been reached the contents have shrunk to a very small mass and the outer membrane has become broken into numerous segments or plates. It is thought by Mr. Webber that the disappearance of the contents of the blepharoplast is correlated in some way with the growth of its outer membrane, possibly being utilized in the growth process

as food material. In an early telephase, the blepharoplast is represented by an irregularly spherical mass composed of round or oblong granules apparently derived from the breaking down of the membrane to which allusion has been made. In a late telephase a slender band may be seen to protrude from this mass and to bend toward the spermatid nucleus. The band increases in length and width, its development being apparently accompanied by the disappearance and fusion of the granules. Webber does not describe or figure a union between the band and the nucleus such as was observed by Ikeno in *Cycas* and by Hirase in *Ginkgo*. The subsequent elongation of the blepharoplast band, its disposition in a helicoid spiral in the cytoplasm just underneath the *Hautschicht* of the free side of the spermatid, and the development of the cilia from it, take place essentially as has been described in *Cycas*. Whether the blepharoplast is to be considered a centrosome or not seems to depend largely upon one's conception of what a centrosome is. Webber in proposing the new term blepharoplast has voiced the hitherto prevalent view as to the nature of the centrosome by remarking: "If the bodies in question are compared to typical centrosomes such as occur in *Fucus*, as described by Strasburger, and in *Stypocaulon*, as described by Swingle, the dissimilarity of the two organs becomes striking. The two most important features of a centrosome, namely, continuity from cell to cell, and forming the centre of an aster at the pole of the spindle during karyokinesis, are not shown by the centrosome like bodies of *Zamia* and *Ginkgo*." Guignard, Ikeno, and Hirase, however, look upon the blepharoplast as a true centrosome modified for the performance of a special function in giving rise to the cilia. Belajeff though not prepared to assert the identity of blepharoplasts and centrosomes in absence of direct evidence, nevertheless holds that this hypothesis has much in its favor. Shaw who finds blepharoplasts in the mother-cells of the spermatids of *Onoclea* and *Marsilia*, sees no ground for believing that they are either homologous or analogous with the centrosomes of the Algæ and Hepaticæ and states that whether there is any relationship whatsoever between these bodies must be determined by a thorough-going investigation of spermatogenesis and zoospore-formation in the lower plants and that at the present moment we are justified only in expressing the view that they are kinoplasmic bodies set apart for the formation of cilia. The existence of centrosomes in the spermatophytes and pteridophytes was left in much doubt in 1897 by the researches of Osterhout, Mottier, Juel, and Strasburger, together with the earlier (1895) investigations of Farmer. Osterhout showed that in the beginning of spindle-formation in the spore mother cells of *Equisetum limosum*, (1) there differentiates itself in the cytoplasm close about the nuclear wall a felted layer consisting of fibers which at first run irregularly but later arrange themselves radially about the nucleus; (2) that through the union of the ends of these fibers several fiber-bundles are formed, giving the structure as a whole a radially multi-polar appearance; (3) that after the disappearance of the nuclear-wall and the union of the fibers with the threads of the linin-network, the spindle becomes bipolar through the blending of the at first independently focussed fiber-bundles. No centrosomes were seen and in the ordinarily accepted view as to their function and mode of action there would be no place for them in the process as here described. Mottier obtained practically the same results in his investigations on the origin of the spindle in the pollen mother cells of several monocotyledons and dicotyledons, as did also Juel in his studies of *Hemerocallis*. During 1898, however, two or three observers have reaffirmed the existence of centrosomes in phanerogams outside of the questionable centrosomes (blepharoplasts) of the lower gymnosperms. Guignard finds them in the pollen mother cells of *Nymphaea* and *Nuphar*. He states that the spindles in an early prophase are sometimes multipolar, but observes very often at their extremities "a granule or a more or less distinct sphere serving as the point of departure for achromatic threads." He adds: "It does not appear permissible to advance the formation of multipolar spindles, which may be accidental or normal as an argument against the existence of dynamic centres during nuclear division. It remains a fact that at a certain time there appear in the cytoplasm bodies distinct from the ordinary granules. It is possible that the construction of the multipolar figures may be independent of the elements which form centrosomes. It may also be true that centrosomes are not always definite morphological units. But it is none the less certain that the higher plants possess differentiated elements whose rôle is the same as that of those analogous bodies observed in the lower plants and in animals." J. H. Schaffner has recently described and figured centrosomes and centrospheres of the typical kind in the dividing cells of the root-tip of *Allium Cepa*. He finds the karyokinetic spindle bipolar from the first and states that it is here an impossibility that it should arise from an aggregation of multipolar structures. E. L. Fulmer gets like results in his studies of cell division in pine seedlings. In no case did he find multipolar spindles in prophases of karyokinesis. However, in sliced or injured karyokinetic figures of the anaphase condition, he observed very rarely spindles which appeared to be multipolar.

The investigations of Belajeff, Hermann, Ikeno, and others upon spermatogenesis now make it probable that the blepharoplast in plants corresponds to the deeply staining *Körperchen* in the spermatid of the salamander and of the mouse, that the ciliiferous band, therefore, of the plant spermatozoid corresponds to the middle-piece of the animal spermatozoon, and that a single cilium of the plant spermatozoid is homologous with the slender thread-like tail of the animal male cell.

B. M. Davis, in studying nuclear division in the tetraspore mother cells of *Corallina officinalis*, var. *Mediterranea*, finds large centrospheres which first make their appearance in the prophase of karyokinesis. They play a part in the formation of the spindle-threads, but seem to vanish entirely in the late anaphase.

D. M. Mottier has discovered what appear to be true centrosomes in the tetraspore mother cells of *Dictyota dichotoma*.

Miscellaneous Cytology.—Important papers on the cytology of the yeast-plant have appeared during the past year, the principal contributors being Janssens and Leblanc, Bouin, Errera, and Wager. Wager finds a "nuclear apparatus" in all yeast-cells, consisting of a never-failing nucleolus (the nucleus of most of the earlier observers) in close contact, in the earlier stages of fermentation, with a vacuole which exhibits a granular chromatin network. In later stages of fermentation, the chromatin-containing vacuole may disappear, its chromatin granules being scattered through the cytoplasm or aggregated about the nucleolus. In budding, there is a division of the nuclear apparatus with no definite stages of karyokinesis. In spore-formation, phenomena are observed which doubtfully indicate a very simple karyokinetic process.

Janssens and Leblanc also find in every yeast cell a nucleus which is made up of a membrane, a caryoplasm, and a nucleinated nucleolus. The nucleus becomes vacuolated at the beginning of the fermentation and in it the nucleolus, in the living state, occupies a central position instead of being external to it as described by Wager. In the budding of *Saccharomyces Ludwigii* and *S. octosporus*, the nucleus shows a rudimentary karyokinetic division; in *S. cerevisiae*, however, the division is direct. In a cell preparing to form spores, two nuclei appear which fuse, resulting, according to these investigators, in a fecundated egg; but this is otherwise explained by Wager. The division of the nucleus resulting from the alleged fusion is attended by the formation of a reduced karyokinetic figure. Errera finds no nuclear body in the young cells of yeast. Bouin states that under certain conditions yeast-cells increase in size and become plurinucleate, that division in the formation of spores always partakes of the indirect method, though in budding direct division is more common.

L. Mitzkewitsch has recently studied cell-division in *Spirogyra* with special reference to the behavior of the nucleus and the so-called nucleous. *Spirogyra subæqua* and *S. jugalis* were the species investigated. It was found that in a strictly resting condition the chromatin is concentrated in the nucleolus, that in the beginning of karyokinesis, processes from this are sent out which extend to the nuclear membrane, resulting, in *S. jugalis*, in the apparent disappearance of the nucleolus through its conversion into a tangle of granular deeply staining threads. Preparatory to the formation of the nuclear plate, the processes of the nucleolus are withdrawn or the threads into which it has been resolved collect at the centre of the nucleus. The chromosomes, in either case, owe their origin to material which is in a strict sense nucleolar.

C. van Wisselingh, also, has studied the nucleolus of *Spirogyra crassa* and the part played by it in cell division, obtaining results quite different from those of Mitzkewitsch, due in great measure, the former thinks, to different methods of investigation. Van Wisselingh finds two rather short and stout nucleolar threads in the resting condition of every nucleus, both enclosed within the membrane of the single nucleolus if only one nucleolus is present, or constituting singly the contents of the two nucleoli if two are found. Two modifications of karyokinesis are said to occur, but in either case the substance derived from the nucleolus forms but a minor part of the nuclear plate and can always by its behavior toward chromic acid be distinguished from the material derived from the nuclear network. In the daughter cells the nucleoli and nuclear network are reformed from the corresponding substances of the mother nucleus.

E. Zacharias takes the ground that for the accurate determination of nuclein the study of stained preparations is not always sufficient, that other microchemical investigations and, if possible, the study of the object in the living condition should be added. Zacharias considers the recent results of Mitzkewitsch in regard to the nature of the nucleolus in *Spirogyra* inconclusive for the reason that they were based wholly upon staining reactions.

Other important cytological papers of the year are,—E. Strasburger: *The Vegetable Cell-Membranes*; C. van Wisselingh: *Microchemical Investigations on the Cell Walls of the Fungi*; W. Belajeff: *On the Reduction-Division of the Plant Nucleus*; B. Debski: *Further Observations on Chara-Fragilis*; C. Hoffmeister: *On the Microchemical Demonstration of Cane-Sugar in Vegetable Tissues*.

Histology and Morphology.—E. C. Jeffrey has found in Canada several hundred prothallia of *Botrychium Virginianum* and has described and figured their structure in detail. The prothallia of *Botrychia* have been quite imperfectly known, partly on account of their subterranean habit of growth; that of *B. Lunaria* was described by Hoffmeister in 1854, and that of *B. Virginianum* by Campbell in 1894, but neither of these investigators was able to study the development of the sexual organs and of the embryo on account of the advanced age of the available prothallia. The gametophyte of *Ophioglossum pedunculatum* was described by Mettenius in 1856, but his observations were somewhat incomplete by reason of paucity of material. Very little else had been added to the knowledge of the gametophyte of the Ophioglossaceæ until the appearance of Jeffrey's paper. The prothallia of *B. Virginiana* are subterranean, wholly destitute of chlorophyll, oval in form, 2-20 mm. in length, and 1.5-15 mm. in breadth, and are all infected by an intracellular endophytic fungus which apparently lives in symbiotic relations with them. The youngest prothallium found bore antheridia, these being situated on a dorsal median ridge, on the flanks of which the archegonia arise a little later. The spermatozoids are of the usual filicineous type. Nothing comparable to a "blepharoplast" was detected. The first division of the fertilized egg is transverse as in the other eusporangiate pteridophytes. The general results of Jeffrey's investigations serve to emphasize the affinity of the Ophioglossaceæ with the Filicineæ and to weaken the force of the comparison with the homoporous Lycopodineæ which has recently been made by Bower.

W. H. Lang, who has been studying apogamy and the development of sporangia upon the fern prothallia, puts forth a provisional hypothesis as to the origin of the sporophyte in archegoniates which corresponds in general outlines with the homologous alternation theory. Mr. Lang admits, however, that the theory of antithetic alternation also affords a possible explanation of the alternation phenomena and that any evidence which would render either one or the other untenable is wanting. Lang finds in the facts of apogamy possible evidence that the vascular cryptogams have been derived directly from algal forms in a line of descent entirely distinct from that of the bryophytes.

W. C. Worsdell, as a result of researches upon the vascular structure of the sporophylls of various Cycadaceæ, finds that though the sporophyll, according to his view, "is a more primitive organ than the foliage-leaf, . . . the main and, physiologically most important part of its vascular structure has become, as a result of the sporangiferous function, much more highly modified from the primitive type than that of the foliage-leaves."

E. Hannig holds that the powder-pits of the stem and leaves of the Cyathaceæ and those of the stipules and leaf-stalks of the Marattiaceæ are comparable organs in structure and development and that they function as pneumatodes, but are in structure and origin not to be compared with ordinary lenticels.

J. P. Lotsy has published results of studies upon the embryology of *Gnetum Gnemon*, largely confirming those obtained by Karsten from other species of this genus. The male gametes are not developed as spermatozoids.

Fr. Oltmanns has published an important paper upon the developmental history of the Florideæ. He finds as a result of exhaustive investigations upon five species that in no case is there a nuclear fusion in the auxiliary cells of the carpogonium and that a double fertilization in the Florideæ in the sense in which it was believed by Schmitz to occur very probably does not exist. His results are not merely negative for he has traced out the behavior of the nuclei of the sporogenous filaments—the ooblastema filaments of Schmitz—in the auxiliary cells and their ultimate fate. Oltmanns recognizes in the Florideæ gametophyte and sporophyte corresponding with the gametophyte and sporophyte of the Muscineæ. The sporophyte frequently sends out branches which come into intimate union with certain cells of the gametophyte, but this union is for the purposes of nutrition and has in it nothing of a sexual character.

Some of the more important papers of 1898 relating to the histological and morphological aspects of botany, outside of those already discussed, are,—H. Vöchting: *On Flower Anomalies*—statistical, morphological, and experimental investigations; A. Boirivant: *Organs of Replacement in Plants*; W. F. Ganong: *Contributions to a Knowledge of the Cactaceæ, II. The Comparative Morphology of the Embryos and Seedlings; Upon Polyembryony and Its Morphology in Opuntia Vulgaris*; D. H. Campbell: *The Development of the Flower and Embryo in Lilaea Subulata* H. B. K.; J. M. Coulter: *Contributions to the Life History of Ranunculus*; E. A. Bessey: *The Comparative Morphology of the Pistils of the Ranunculaceæ, Alismaceæ, and Rosaceæ*; W. R. Smith: *A Contribution to the Life History of Pontederiaceæ*; C. MacMillan: *The Orientation of the Plant Egg and Its Ecological Significance*; T. Holm: *Pyrola Aphylla, a Morphological Study*; F. E. Lloyd: *On an Abnormal Cone in the Douglas Spruce, Pseudotsuga Mucronata, On Hypertrophied Scale-Leaves in Pinus Ponderosa*; D. S. Johnson: *On the Development of the Leaf and Sporocarp*

in *Marsilia Quadrifolia* L., On the Leaf and Sporocarp of *Pilusaria*; A. Y. Grevillius: On the Morphological Value of the Blood-organs in *Aulacomnium Androgynum* (L. Schwaegr.); R. W. Phillips: The Development of the Cystocarp in the Rhodymeniales, II. Delesseriaceæ; A. H. Church: The Polymorphy of *Cutleria Multifida* (Grey.); J. Eriksson: A General Review of the Principal Results of Swedish Research into Grain Rust; Bertha Stoneman: A Comparative Study of the Development of Some Anthranoses; P. Magnus: On *Accidium Graveolens* (Shuttlew).

Plant Physiology.—Experiments to show the effect of the X-rays upon the various phases of plant-life have in most cases seemed to prove that they exert no special influence. MM. Maldiney and Thouvenin, however, report that, while the rays are without influence upon the formation of chlorophyl, they do, under the proper conditions, hasten quite perceptibly the germination of certain seeds.

B. Raciborski announces the discovery in vascular plants of a substance to which he gives the name *leptomin*. It occurs especially in the sieve-tubes and laticiferous vessels, organs which are concerned particularly with the transfer of organic food-materials, though it is found also in the lenticels, pneumatodes, and aerenchymatous tissues of certain plants. From the localization of leptomin and its chemical behavior, Raciborski believes that it is concerned in respiration and that it plays a rôle in plants analogous to that of the haemoglobin and haemocyanin of animals; that is, it serves as an oxygen-laden vehicle for the maintenance of the inner breathing. In a subsequent paper, however, Raciborski admits that the question as to the function of leptomin is still an open one.

B. Schmid finds that the awns of the Gramineæ play an important part in the transpiration activities of the plant, and that in many cultivated barleys and wheats they carry on $\frac{1}{4}$ to $\frac{1}{3}$ the entire transpiration of the plant, their activity being proportionately greater in the night than in the day and also in diffuse sunlight than in direct.

Ch. Dassonville has made extended researches upon the influence of mineral salts upon the form and structure of plants. He determines that cutinization, sclerification, and lignification, are more pronounced in young plants grown in distilled water than in those of the same age grown in mineral solutions and argues that in the absence of high nutrition the seedling devotes itself to cell differentiation, while on the other hand, if grown in a rich nutrient medium, its energies go to cell multiplication with less differentiation. The effect of different salts upon the development of the various tissues was also investigated.

J. Wiesner has shown that in "high northern latitudes (Advent Bay, Tromsö) the chemical intensity of the total daylight, with equal elevation of the sun and equal cloudiness, is greater than in Vienna and Cairo, but less than in Buitenzorg, Java;" that, with some exceptions, the share of the total light which plants obtain is greater the smaller the intensity of the total light is; and that the greatest proportion of the total light is received by plants of the arctic regions.

The researches of S. H. Vines during 1898 confirm his results published during the preceding year that, contrary to the views of Dubois and Tischutkin, the pitcher-liquid of *Nepenthes* contains a proteolytic enzyme. This enzyme appears to be derived from a zymogen present in the gland-cells. It is very stable and is most active in an acid medium.

J. R. Green, endeavoring to confirm the discovery announced by Buchner in 1897 that the alcoholic fermentation of sugar is due to a soluble ferment or enzyme, which, by proper means, can be extracted from the yeast-cells, has carried on experiments during both 1897 and 1898. His first results, when he made use of yeasts practically in a resting condition, after the greatest activity of the fermentation had subsided, were negative, and he came to the conclusion that the English yeasts, at least, contained no alcohol-producing enzyme. In his later researches, however, he used for purposes of extraction yeasts taken at the moment of their greatest activity in fermentation, and thus obtained an easily decomposed enzyme, essentially confirming the statements of Buchner. The yeast was crushed and filtered until no cells could be detected in the filtrate by microscopical examination, and, as a check against error from inclusion of unobserved living cells, there was added to the solution an excess of chloroform, which prevents the growth of the yeast.

G. Hörmann has published the results of studies upon the protoplasmic streaming in the Characeæ. He finds an explanation of the direction and plane of streaming in the advantage of guarding against loss of materials by securing the shortest route between the place of their absorption or elaboration and the place of their utilization. He discovers that the *Nitella* cell may be stimulated and concludes that there is a conductive plasma differing in nature from the substance which is concerned with the phenomena of contraction and streaming.

W. and G. S. West have called attention to the wide occurrence of parthenogenesis and various methods of non-sexual propagation in the Conjugatæ.

H. O. Juel has made a careful embryological study of *Antennaria alpina* and seems

to have demonstrated that parthenogenetic reproduction occurs here—what had before been circumstantially assumed for this species by Kerner and also for other species of the same genus by E. L. Greene.

Nawaschin, as a result of investigations upon the behavior of the pollen-tube in the dm, holds the view that in *Ulmus pedunculata* and *U. montana* a transitional type from chalazogamy to porogamy is to be recognized.

Some of the remaining physiological papers of 1898 are,—

J. Wiesner: *On Heliotropism produced by diffuse Daylight*; H. Vöchting: *On the Influence of low Temperature on Sprout Direction*; L. Jost: *Contributions to the Knowledge of nyctitropic Movements*; F. A. F. C. Went: *Chemico-physiological Investigations on the Sugar-cane*; J. Katz: *The regulatory Formation of Diastase by Fungi*; M. Nordhausen: *Contributions to the Biology of parasitic Fungi*; G. Bitter: *On the Behavior of Crustaceous Lichens in the meeting of their Margins*; R. Kolkwitz: *On the influence of Light upon the Respiration of the Lower Fungi*; G. Curtel: *Physiological Researches on the Flower*; D. T. MacDougal: *A Contribution to the Physiology of Tendrils*; B. D. Halsted: *Starch Distribution as affected by Fungi*; F. L. Stevens: *The Effect of Aqueous Solutions upon the Germination of Fungus Spores*; W. C. Sturgis: *On some Aspects of Vegetable Pathology and the Conditions which influence the Dissemination of Plant Diseases*; R. H. True: *The physiological Action of certain plasmolyzing Agents*; H. H. Dixon: *On the Effects of Stimulative and Anæsthetic Gases on Transpiration; Transpiration into a saturated atmosphere*; F. DeF. Heald: *A Study of Regeneration as Exhibited by Mosses; Conditions for the Germination of the Spores of Bryophytes and Pteridophytes*; C. Correns: *On the Propagation of Musci by Leaf-and-Sprout-Fragments*.

Ecology and Plant Geography.—A striking feature of the botanical activity of 1898 is the attention that has been given to plant-ecology and plant-geography. "Ecology" has been defined by Haeckel as "the knowledge of the sum of the relations of organisms to the surrounding outer world, to organic and inorganic conditions of existence," including the adaptations of organisms to their surroundings, their modifications in their struggle for existence, etc. An important ecological publication of the year is a richly illustrated book of 876 pages by A. F. W. Schimper, dealing with plant-geography on a physiological basis. Another is F. Pax's *Outline of Plant Distribution in the Carpathians*, constituting the second volume of Drude's *Die Vegetation der Erde*. A two-volume work on phytogeography and ecology is R. Gradmann's *Plant Life of the Swabian Alps*. An ecological work of a special character—of which vol. I and the first part of vol. II have appeared—is P. Knuth's *Handbook of Flower-biology*, based upon H. Müller's *Fertilization of Flowers by Insects*. Among other ecological books and papers of note published in 1898, may be mentioned J. Constatin: *Plants and their Cosmic Environment*; Borgesen and Paulsen: *On the Vegetation of the Danish West-Indian Islands*; R. Pounds and F. E. Clements: *The Phytogeography of Nebraska. I. General Survey and the Vegetation Regions of the Prairie Province*; W. L. Bray: *On the Relation of the Flora of the Lower Sonoran Zone in North America to the Flora of the Arid Zones of Chile and Argentine*; Colgan and Scully: *Contributions towards a Cybele Hibernica, being outlines of the Geographical distribution of plants in Ireland* (2d ed.—founded on papers of the late A. G. Moore); L. Blanc and E. Decrock: *Geographical Distribution of the Primulaceæ*; L. Adamovic: *The Vegetation-formations of East Servia*; E. Ihne: *On the Phænology of Coimbra*; E. Ule: *On the Floral-contrivances of some Aristolochias in Brasil*; Charles Robertson: *Flowers and Insects*.

Text-Books and Works Relating to General Botany.—An important botanical publication of 1898 is Prof. K. Goebel's *Organography of Plants*. Part I, dealing with general organography, and the first section of part II, dealing with the special organography of the bryophytes have already appeared. The second edition of Kerner's *Pflanzenleben*, the first edition of which has become widely known to English speaking peoples through Prof. Oliver's translation, has now been completed. Of other standard botanical works, new editions may be mentioned as follows: Strasburger, Noll, Schenck, and Schimper: *Textbook of Botany for High Schools*, 3rd ed., and also an English translation of the 2nd ed. (1895) by H. C. Porter; Ph. Van Tieghm: *Éléments de Botanique*, 3rd ed.; Wiesner: *Anatomy and Physiology of Plants*, a 4th ed. of the first part of his *Elements of Scientific Botany*; L. Trabut: *Digest of Medical Botany*, 2nd ed. Among new text-books for the use of schools and colleges are—G. F. Atkinson: *Elementary Botany*; C. R. Barnes: *Plant Life considered with special reference to form and function*; Th. Bokorny: *Text-Book of Botany*; Poli and Taufani: *Descriptive and Comparative Botany for the use of Gymnasia* (2 vols.); A. Meyer: *First Practicum for the Microscope. An introduction to the Use of the Microscope and to the Anatomy of the higher Plants*; S. H. Vines: *An Elementary Text-book of Botany*; Percy Groom: *Elements of Botany*;

L. H. Bailey: *Lessons with Plants*; J. C. Arthur and D. T. MacDougal: *Living Plants and their Properties*; W. J. Beal: *Seed Dispersal*; C. M. Weed: *Seed Travellers—a study of methods of distribution of various common seeds*; A. C. Seward: *Fossil Plants, for students of botany and geology*; A. B. Frank: *Manual of Agricultural Botany* (English translation by J. W. Patterson); M. Hollrung: *Handbook of Chemical Resources against Plant Diseases*; G. Dragendorff: *The Medical Plants of various Peoples and Times*.

Systematic Botany, General.—A recent work of general interest relating to systematic botany is the second edition of Engler's *Syllabus of the Families of Plants*, which is based upon Engler and Prantl's "*Die natürlichen Pflanzenfamilien*," with some modifications to embody the results of modern discoveries and Engler's more recent views as to the outlines of classification. The Conjugatæ are excluded from the Chlorophyceæ and made a class coördinate with the latter; the lichens appear again as a single group with the rank of a "Nebenklasse;" *Ginkgo* is made to constitute a class—the Ginkgoales—coördinate with the Cycadales, Coniferæ and Gnetales; and the use of chalazogamy and porogamy in the classification of the angiosperms is abandoned. The important *Die natürlichen Pflanzenfamilien* of Engler and Prantl has been advanced during the year by the publication of several parts; the *Umbellifera* have been elaborated by Drude and the *Cornaceæ* by Harms, thus completing the treatment of the Archichlamydeæ (Apetalæ and Polypetalæ); introductory discussions of the Pteridophyta by Sadebeck, of the Musci by C. Müller (Berlin), and of the *Phallineæ* by E. Fisher, have appeared, and the treatment of the Hymenomycetinae by P. Hennings has been brought to a close.

A continuation of O. Kuntze's *Revisio Generum Plantarum*, suggesting many changes in the current nomenclature, is of interest to taxonomists. Of systematic works having an unlimited geographical range, some of the more important for the year 1898 are—F. Stephani: *Species Hepaticarum*, a beginning of the description of all the known Hepaticæ of the world; O. Warburg: *Monograph of the Myristivaceæ*; Madame Weber-Van Boose: *Monograph of the Coulerpas*; E. B. Uline: *A Monograph of the Dioscoreaceæ*; O. V. Darbishire: *Monograph of the Rocellei*; F. Hildebrand: *The Genus Cyclamen*; A. Brand: *Monograph of the Genus Lotus*; A. Froehner: *The Genus Coffea and its Species*; R. Schlechter: *Revision of the Genus Holothrix*, also a *Monograph of the Disperideæ*; Fr. Buchenau: *Lusula campestris and related Species*; K. Fritsch: *On the Taxonomy of the Genus Sorbus*; K. von Keissler: *The species of the Genus Daphne of the Section Daphnanthes*; F. N. Williams: *Revision of the Genus Arenaria*, also *A Provisional Enumeration of the Species of the Genus Cerastium*; A. Engler: *Revision of the Genus Anthurium Schott*; P. Parmentier: *Anatomical and Taxonomic Researches on the Roses*; H. C. Irish: *A Revision of the Genus Capsicum with special reference to the garden varieties*; G. Massee: *Revision of the Genus Cordyceps*; C. Warnstorf: *Contributions to the Knowledge of exotic and European Bog-mosses*; M. Heeg: *Contributions on some Species of the Genus Riccia*; C. Sauvageau: *On some Myrionemaceæ*.

Europe.—Among the principal books and papers of the year relating to the systematic botany of Europe may be mentioned—Ascherson and Graebner: *Flora of the northeast German Lowlands*, (farther East-Prussia), also continuations of their *Synopsis of the middle-European Flora*; Garcke: *Illustrated Flora of Germany*, (18th ed.); E. G. Camus: *Catalogue of the spontaneous hybrid Plants of the European Flora*; Migula: *Synopsis of the European Characeæ* (illustrations and descriptions, with reference to those of other parts of the world—an abstract of his elaboration of this group for Rabenhorst's *Kryptogamen-Flora*); J. Neuberger: *Flora of Freiburg*; A. X. P. Coutinho: *The Monocotyledons of Portugal*; Th. Heldreich: *Flora of the Island of Eginæ*; Limpricht, in the *Rabenhorst Kryptogamen-Flora* has completed his treatment of *Amblystegium* and begun that of *Hypnum*.

Asia.—Some of the more important floristic works of the year relating especially to Asia and the adjacent islands are—G. King and R. Pantling: *The Orchids of the Sikkim-Himalaya*, a magnificent monograph constituting the eighth volume of the *Annals of the Royal Botanic Garden at Calcutta*; A. Franchet: *Plantarum Sinensium Eclogæ Secunda*; H. de Boissieu: *The Leguminosæ of Japan collected by M. l'Abbé Faurie*; J. Freyn: *On new and noteworthy species of oriental Plants*; J. Bornmüller: *A Contribution to the Flora of Syria and Palestine*; H. W. Feilden: *The Flowering Plants of Novaya Zemlya*; K. Schumann: *Flora of New Pomerania*; H. Hallier: *New and noteworthy Plants from the Malay-Papuan Islands*; Raciborski: *The Pteridophytes of the Flora of Buitenzorg* (the first part of a projected convenient systematic guide to the flora of the region of the Botanical Garden at Buitenzorg, Java); H. Christ: *Ferns of the Philippine Islands*, also, *Ferns of Mengtze (China)*; Baroni and Christ: *Ferns and Fern-allies collected in China by Rev. Giraldis*; A. Geheeb: *On the Moss-flora of New Guinea and Borneo*; K. Müller: *Bryologia Giraldisiana*; E. Bescherelle: *Bryologia Japonica Suppl. I*;

C. Holterman: *Mycological Researches from the Tropics*; M. Raciborski: *On the seven Slime-moulds*; N. Patouillard: *Some Fungi from Java*; papers on the Asiatic flora have been published also by B. and O. Fedtschenko.

Africa.—Notable advances in the knowledge of the African flora have been made during the year. Part II. of the first volume of the *Conspectus Floræ Africæ* by Th. Durand and Hans Schinz and the second fascicle of Durand and Wildeman's *Materials for the Flora of the Congo* have appeared, as has also the second part of W. P. Hiern's *Catalogue of the African Plants collected by Dr. Friedrich Welwitsch in 1853-'61*. Other papers of importance relating to African plants have been published by Engler, Schinz, Diels, Gürke, Giggl, Hallier, Schlechter, Schmidle, Schönland, E. G. Baker, and Rendle.

Polynesia.—F. Reinecke has completed his *Flora of the Samoan Islands*; K. Müller has continued his work on the bryology of Australia; and E. Bescherelle has published papers bearing upon the bryological flora of Tahiti and other of the Society Islands.

North America.—The publication of the third and final volume of Britton and Brown's *Illustrated Flora of the Northern United States, Canada, and the British Possessions*, is an important event in the progress of systematic botany in America. In the entire work 4,162 species are described and illustrated. The nomenclature is revised in accordance with the rules adopted by the Botanical Club of the American Association for the Advancement of Science and the arrangement of the classes, families, etc., is intended to express as well as is possible in a lineal sequence the latest advances of knowledge in regard to their mutual affinities. The 12th volume of C. S. Sargent's elaborate *Sylva of North America*, concluding the treatment of the *Coniferae* has appeared. Of the papers of the year relating to the systematic botany of the North American continent and outlying islands, the following may be mentioned—I. Urban: *Symbolæ Antillanæ seu Fundamenta Floræ Indiæ Occidentalis*, the beginning of what is intended to be a comprehensive work on West Indian botany; P. A. Rydberg: *Monograph of the North American Potentilleæ*; E. L. Greene: *Studies in the Compositæ, New or Noteworthy Species, Critical Notes on Antennaria, New Compositæ from New Mexico*; B. L. Robinson: *Revision of the North American and Mexican Species of Mimosa, Revision of the North American Species of Neptunia, New Species and Extended Ranges of North American Caryophyllaceæ*; J. K. Small: *Studies in the Botany of the South-eastern United States, Studies in the North American Polygonaceæ, Notes and Descriptions of North American Plants*; M. L. Fernald: *The Genus Antennaria in New England, Notes Upon Some North-western Castillejas of the Parviflora Group*; J. M. Greenman: *Revision of the Mexican and Central American Species of Galium and Rubium, Diagnoses of New and Critical Mexican Phanerogams, Some New and Other Noteworthy Plants of the Northwest*; A. M. Vail: *Studies in the Asclepiadaceæ*; Alice Eastwood: *Studies in the Herbarium and Field*; J. Donnell Smith: *The Polypetale in Pittier's Primitiæ Floræ Costaricensis, Undescribed Plants from Guatemala and other Central American Republics*; A. A. Heller: *New and Interesting Plants from Western North America, Catalogue of North American Plants North of Mexico, Exclusive of the Lower Cryptogams*; G. V. Nash: *New or Noteworthy American Grasses, A Revision of the Genera Chloris and Eustachys in North America, The Genus Syntherisma in North America*; F. Lamson-Scribner: *Descriptions of New or Little-Known Grasses*; T. H. Kearney, Jr.: *A Revision of the North American Species of Calamagrostis*; A. Nelson: *New Plants From Wyoming*; E. O. Wootton: *New Plants from New Mexico*; C. L. Pollard: *Further Observations on the Eastern Acaulescent Violets*; C. H. Thompson: *A Revision of the North American Lemnaceæ Occurring North of Mexico, The Species of Cacti Commonly Cultivated Under the Generic Name Anhalonium*; C. D. Beadle: *Notes on the Botany of the South-eastern States*; C. F. Millspaugh: *Contribution III. to the Coastal and Plain Flora of Yucatan*; V. K. Chestnut: *The Principal Poisonous Plants of the United States*; W. N. Clute: *Flora of the Upper Susquehanna and Its Tributaries*; L. M. Underwood: *Selaginella Rupestris and Its Allies, The Ternate Species of Botrychium*. G. S. Jenman has continued his systematic work upon the ferns and fern allies of the British West Indies and Guiana; B. D. Gilbert: *A Revision of the Bermuda Ferns*; K. Muller: *Analecta Bryographica Antillarum*; A. J. Groat: *A Revision of the North American Eurhynchia*; M. A. Howe: *The Anthocerotaceæ of North America, New American Hepaticæ*; J. B. Ellis and B. M. Everhart: *New Species of Fungi from Various Localities*; C. H. Peck: *New Species of Fungi*; F. S. Earle: *New or Noteworthy Alabama Fungi*; C. G. Lloyd: *A Compilation of the Volvæ of the United States*; W. G. Farlow: *Some Edible and Poisonous Fungi*; P. Hennings: *On North American Fungi*; A. Schneider: *A Guide to the study of Lichens*; DeAlton Saunders: *Phycological Memoirs*; L. K. Rosenvinge: *A second memoir on the algal vegetation of the Coast of Greenland*; F. H. Knowlton: *A Catalogue of the Cretaceous and Tertiary Plants of North America*.

South America.—Among the works of the year bearing upon the botany of South

America, the principal are—*Fascicle 123 of Martius' Flora Brasiliensis*, consisting of a continuation of the treatment of the Orchidaceæ by A. Cogniaux; J. Arechavaleta: *The Grasses of Uruguay* (a book of 553 pages) and also a continuation of the *Flora of Uruguay*; A. Sodiro: *Plantæ Ecuadorensis I.* (descriptions contributed by Gilg, Schumann, Hallier, Lindau, and Pilger); R. Chodat: *Plantæ Hassleriana* (from Paraguay); G. Hieronymus: *Plantæ Stubelianæ Novæ*; H. H. Rusby: *An Enumeration of the Plants Collected by Dr. H. H. Rusby in South America 1885-86*; C. DeCandolle: *Piperaceæ Boliviana*, also, *Piperaceæ Sodiroana*; R. Keller; *On Central and South American Hyperica of Herb. Hauniense*; L. Radlkofer: *New Species of Sapindaceæ from South America*; H. Christ: *Ferns Collected in the Lower Basin of the Amazon by Dr. J. Huber*; K. Müller has described many new mosses from Brazil; A. W. Evans: *An Enumeration of the Hepaticæ Collected by John B. Hatcher in Southern Patagonia*; H. Rehm: *Contributions to the Fungus-Flora of South America*.

Botanical Societies.—The fourth annual meeting of the Botanical Society of America was held in Boston August 19 and 20, 1898, under the presidency of N. L. Britton. The address of the retiring President, J. M. Coulter, was upon *The Origin of Gymnosperms and the Seed Habit*. Nine papers were read. Officers for the ensuing year were elected as follows: President, L. M. Underwood; Vice-President, B. L. Robinson; Treasurer, Arthur Hollick; Secretary, G. F. Atkinson; Councillors, C. E. Bessey and W. P. Wilson.

The fiftieth anniversary meeting of the American Association for the Advancement of Science was held in Boston August 22-27, 1898, with W. G. Farlow as Vice-President and Chairman of section G (botany) and E. F. Smith as Secretary. Fifty-six papers were read, including a few by title only. The subject of Vice-President Farlow's address was: *The Conception of Species as Affected by Recent Investigations on the Fungi*. For the ensuing year, C. R. Barnes was elected Vice-President and Chairman of the section, W. A. Kellerman, Secretary.

At the meetings of the "Botanical Club" of the American Association for the Advancement of Science, held in conjunction with those of the section of botany, twelve papers were read. As officers for the succeeding year, the following were chosen: President, B. D. Halsted; Vice-President, F. H. Knowlton; Secretary, Stewardson Brown.

"The Society for Plant Morphology and Physiology" held its first scientific meeting with the American Society of Naturalists and the affiliated societies at Cornell University, Ithaca, N. Y., December 28 and 29, 1897. Its second meeting, also in conjunction with the societies mentioned, was held at Columbia University, New York City, December 28 and 29, 1898. The officers for 1898 were: President, W. G. Farlow; Vice-Presidents, J. M. Macfarlane, G. F. Atkinson; Secretary-Treasurer, W. F. Ganong. Dr. Farlow's presidential address was entitled, *Peculiarities of the Distribution of Marine Algae in North America*. The officers of the society for 1899 are: President, J. M. Macfarlane; Vice-Presidents, G. F. Atkinson, D. P. Penhallow; Secretary-Treasurer, W. F. Ganong.

The 1898 meeting of the British Association for the Advancement of Science was held in Bristol. Prof. F. O. Bower delivered the presidential address before the section of botany, dealing principally with the matter of *Alternation of Generations* in plants.

Botanical Gardens.—Much progress has been made during 1898 in the development of the New York Botanical Garden, which is destined to become an important factor in the botanical activities of America and of the world. Ground was broken early in the year for the Museum Building and the close of the year finds the great edifice, which is four stories in height and has a frontage of about 304 feet, nearly complete in outline. Ground has been broken also for the first and largest of the proposed horticultural houses.

Plans have been outlined during the year for the museum and conservatories in the Royal Botanical Gardens in Dahlem near Berlin. Miss Anne H. Cruikshank has given £15,000 for the formation and maintenance of a botanical garden in Old Aberdeen, Scotland.

Necrology.—The necrological list for 1898 includes the botanists Ferdinand Cohn, Anton Kerner von Marilaun, Axel Blytt, F. W. R. Suringar, Leopold Krug, François Gay, J. M. C. Lange, Emil Fiek, Emil Schmidt, Karl Nöldecke, Sven Borgström, Cav. Guiseppe Gibelli, T. Caruel, Ch. Kaurin, E. Lewis Sturtevant, and G. H. Hicks.

In conclusion, it may be affirmed that the year 1898 has been one of much activity and substantial progress in all lines of botanical investigation, and the contributions to the literature of the subject have been numerous and valuable.

BOUNTIES ON EXPORTS are granted by some governments for the purpose of encouraging the production and exportation of certain articles of commerce. The United States tariff act of July 24, 1897, in one of its clauses provided for the assessment of additional duty upon imported merchandise which had received a bounty from the country of production. In order

to carry out this provision the consular and diplomatic officers of the United States in foreign countries were requested to furnish information as to bounties granted by the several governments. The reports were sent in to the Treasury department and a summary of their contents was published in the United States Consular Reports for December 1898. The following is the list of countries and colonies in regard to which the consuls or other diplomatic officers reported that there were no enactments or ordinances conferring special grants or bounties upon any class of merchandise: Barbadoes, Belgium, British Honduras, Chile, China, Colombia, Dominican Republic, Ecuador, Leeward Islands, Morocco, Paraguay, Peru, Russia, Samoa, Society Islands, Sweden and Norway, Switzerland, Turkey, Venezuela. Some of these countries, however, indirectly stimulate certain industries by methods akin to the granting of bounties. The more common method is by the granting of drawbacks or rebates of the excise in the case of certain products which are exported. Thus in Belgium if a manufacturer of raw beet sugar declares to the excise department that from 3,850,000 pounds of beet juice he produces 2,204,600 of raw beet sugar each year, he is credited with a certain sum of money equivalent to a rate of \$8.68 for every 381 pounds of beet juice consumed, or 45 francs for every 100 kilograms of beet sugar produced. This law went into effect on August 15, 1898. The report from Russia shows that while there is no law establishing bounties on exports, the excise duty is remitted in the case of merchandise destined for export and the government reimburses exporters of cotton products for the customs duties paid on the materials used in their manufacture. There is also a rebate of the customs duties in the case of gold, silver, and gilded gimp. In Norway and Sweden the tax on the manufacture of whiskey is remitted when the whiskey is destined for export. In Sweden drawbacks are allowed on the following articles manufactured in whole or in part from imported raw materials when these articles are destined for exports: Sugar, chocolate, candy, bread, manufactures of tobacco, cotton, cotton and woolen yarn, cotton and linen cloth. Several countries like Ecuador, Nicaragua and Uruguay levy a tax on certain articles of export.

The countries reported as having bounties on exports are Argentine Republic, France, French West Indies, Germany, Haiti, Japan, Miquelon, and Netherlands. In these countries sugar is the principal product thus favored. The legislation of Argentine Republic confers a bounty on sugar alone. The law provides that all sugars produced in the country shall pay an internal tax of 6 centavos per kilogram, but that in exchange for this tax the executive power will deliver a certificate which will give the holder the right to export 35 per cent. of the sugar upon which he may have paid said tax, and to receive in return 12 centavos per kilogram for the amount exported. These certificates or drawbacks, however, will be withheld whenever the current wholesale price of sugar rises beyond a certain point, namely \$4.00 (Argentine currency) per 10 kilograms. France also grants sugar bounties at the rate of 53.461 cents per 100 kilograms (220.46 pounds) for raw sugars of the highest grade, that is, such as yield at least 98 per cent. in the case of beet root sugar or 97 per cent. for colonial sugars; and at the rate of 46.706 cents per 100 kilograms of refined sugar for the next lower grade, that is, when the raw sugar yields from 65 to 98 per cent. in the case of beet root sugar or from 65 to 97 per cent. in the case of colonial sugars. On candied sugars there is a bounty of 60.023 cents per 100 kilograms. The complex legislation in regard to sugar in the French West Indies has the effect of the granting of bounties, the rate varying according to the beet crop. In 1890-91 the rate was \$1.65 per 100 kilograms (220.46 pounds) of pure sugar. In the following year it was \$1.10 and in 1896-97 it was \$1.53. In Germany there is a direct export bounty only in the case of sugar, but indirect bounties through the remission of the internal revenue tax exist in the case of spirits and some other products. Haiti grants no bounty except on sugar and this article has not been exported in recent years, the small production being sufficient only for home consumption. Japan grants a bounty on prepared tea for the purpose of extending the market for that commodity. Of this bounty the greater part was to be applied in 1898 to the opening of markets and establishment of agencies in North America. In Miquelon the French government pays a bounty of ten francs (\$1.93) per 50 kilograms (110 pounds) on dry codfish destined for exportation. The legislation of the Netherlands permits only the granting of bounties on raw and refined sugars. The grant is not limited to the sugar exported but is accorded to all sugars leaving the factories or refineries as a general stimulus to production.

On June 10 an international conference in regard to a concerted policy on the part of the governments respecting sugar met at Brussels, Belgium, but was adjourned on June 25, having accomplished nothing of importance on account of the refusal of France and Russia to give up their policy of granting export bounties.

BOURGET, PAUL. See FRENCH LITERATURE (paragraph Fiction).

BOWDOIN COLLEGE, at Brunswick, Maine, was founded in 1794, is non-sec-

tarian but closely affiliated with the Congregational denomination, and is for men only. Since 1885 the president has been William DeWitt Hyde, D. D., under whose administration the college has greatly developed. The officers of instruction number about 32; the student enrollment in 1898 was: medical students, 140; seniors, 61; special students, 6; total, 383. The college is governed by fifty-four trustees and overseers. The bound volumes in the library number over 60,000. About one-half the college course is elective, and while the aim of the college is not specialization, opportunities are afforded for original investigation; no graduate instruction is given. In 1894 the college celebrated its centennial anniversary and dedicated the Walker Art Building, donated by the Misses Walker of Waltham, Massachusetts. It is a rectangular building of granite, limestone, and brick, surmounted by a dome, and has interior decorations by Messrs. La Farge, Vedder, Thayer, and Cox. Another building, given in the name of the late Mrs. F. S. Searles by Mr. E. F. Searles, was recently erected at a cost of about \$60,000 for the scientific departments. It is a three-story building, in Elizabethan style, of brick and stone, and contains lecture rooms and laboratories. Other recent gifts are the Fayerweather bequest of \$100,000, and the bequest of the late Mrs. C. M. Garcelon of Oakland, California; the latter to be divided equally between the college and the medical school, will become available about 1901. Both of these benefactions are for the scholarship fund. In 1896 a new athletic field was purchased and completed.

BOYS' BRIGADE, a movement started about 1884 by W. A. Smith of Glasgow, for "the advancement of Christ's Kingdom among boys and the promotion of habits of obedience, reverence, discipline, self-respect, and all that tends towards a true Christian manliness." The boys wear a uniform and have regular military drill. There are 2,850 officers and 35,000 boys in the United Kingdom; in the United States of America there are 550 companies with 25,000 boys; and in Canada, 120 companies with 4,500 boys.

BRADFORD is one of the most important manufacturing towns of England. It is situated in the West Riding of Yorkshire on a tributary of the Aire, and had an estimated population in 1896 of 231,260. Its trade with the United States has for many years been very important. The report of the American Consul dated January 14, 1898, showed an increase of nearly \$11,000,000 in the exports from Bradford to the United States during the calendar year 1897 over those for the year 1896. In 1897 the total amount of declared exports was \$24,471,035. The principal article was wool, next to which came worsted coatings, cotton goods, and wool tops. The exports during the year 1897 showed great fluctuations which are explained by the anticipation and realization of the Dingley tariff. Upon the passage of the new measure several of the former exports were discontinued.

BRAINE, DANIEL LAWRENCE, Rear-Admiral U. S. N. (retired), died in Brooklyn, New York, January 30, 1898. He was born in New York City May 18, 1829, was appointed midshipman in 1846, and the next year took part in the bombardment of Vera Cruz. In the Civil War, besides performing blockade duty he saw service in the engagements at Hatteras Inlet, Forts Caswell and Fisher, Rappahannock River, and Sewell's Point. Through bravery he became lieutenant-commander in 1863, and was at the fall of Richmond two years later. He became captain in 1875, commodore in 1885, and rear-admiral in 1887.

BRAZIL, the largest republic of South America, comprises twenty States and a federal district whose total area has been (1890) officially estimated at over 3,209,000 square miles, and whose population, according to the census of 1890, was more than 16,300,000. Amazonas and Matto Grosso are the two largest States, their areas being respectively 732,460 and 532,708 square miles; they are also the least populous, there being an average of less than one person to each five square miles. Minas Geraes has the most inhabitants, 3,184,000. The population is densest in Sergipe, where there are over 42 to the square mile, except in the federal district, where there are about 1,000 to the square mile. The capital is Rio de Janeiro, the population of which in 1892 was 522,031; other important cities are Bahia (pop. 200,000), Pernambuco (190,000), San Paulo (100,000), Belem (65,000), Porto Alegre (55,000), Parahyba (40,000), Maranhao (38,000), Ceará (35,000), Pelotas (30,000), Ouro Preto (22,000). The inhabitants in the seaports are chiefly of European descent; those in the northern provinces are to a great extent Indians, while the negroes are numerous in Rio de Janeiro, Bahia, Pernambuco, and Minas. Immigrants to the number of 860,991 entered Brazil from 1871 to 1892. Since the latter year the immigration through Santos, Victoria, and Rio de Janeiro has been: 1892, 86,513; 1893, 84,143; 1894, 63,294; 1895, 164,371; 1896, 157,948. The immigration of the last named year included 96,324 Italians, 24,154 Portuguese, and 11,366 Austrians and Hungarians. In Rio Grande do Sul there are fifteen colonies, with a total of 100,000 inhabitants, occupying 1,389,690 acres, of which 543,743 acres are under cultivation. The immigrants entering Rio de Janeiro in 1897 numbered 44,225, a majority of whom settled

ⁱⁿ Minas-Geraes. It was stated that 21,261 of them came voluntarily, while 22,964 received some kind of assistance. The males numbered 29,604 and the females 14,621. Various nations were represented as follows: Italy, 27,454; Portugal, 7,423; Spain, 7,253; Germany, 420; Russia, 392; Syria, 388; Armenia, 219; France, 215; Austria, 132; other countries, 329.

Government.—Each of the old provinces now constitutes a State, has the power of imposing export duties, and is administered at its own expense without interference from the Federal government, except for the maintenance of public order and the execution of Federal laws. The national Congress legislates upon matters of import duties, rates of postage, stamps, and bank-note circulation. According to the constitution, which was adopted in February, 1891, the executive authority is vested in a president, who is elected for four years by a majority popular vote. He must be a native of the country, must be over thirty-five years of age, and must not be "related by blood or marriage, in the first or second degree, to the actual president or vice-president, or to either who has ceased to be so within six months," and he is ineligible for the ensuing term. The president is assisted in the exercise of his functions by a cabinet, which is not responsible, and the ministers of which he appoints to the following six departments: Finance; justice, the interior, and public instruction; foreign affairs, industry, communications, and public works; war; marine. He also appoints, with the consent of Congress, the members of the Supreme Federal Tribunal and the diplomatic representatives, and has the highest authority over the army and navy. The President of the Republic for the term beginning November 15, 1898, was Senhor Don M. F. de Campos Salles.

The legislative authority devolves upon a Congress of two houses, a Senate and a Chamber of Deputies. The upper house consists of 63 members (three from each State and the Federal district) elected for nine years by popular vote, one-third retiring every three years. The deputies, 212 in number, are elected for three years, by direct vote, the proportion being not greater than one to every 70,000 inhabitants, but no State is represented by less than four deputies. The States have the following representatives: Minas Geraes, 37; São Paulo, 22; Espirito Santo, 22; Rio de Janeiro, 17; Pernambuco, 17; Rio Grande do Sul, 16; Ceará, 10; Federal district, 10. No member of Congress may hold another paid office except such as is military, diplomatic, or imposed by law, and he cannot be a member of the cabinet or be associated with any company subsidized by the government. Male citizens twenty-one or more years of age are legal voters, except illiterates, soldiers in actual service, beggars, and ecclesiastics under vows of obedience.

The constitution directs that the organization of each State be on the basis of republican government and provides for distinct and independent executive, legislative, and judicial branches. The governor and legislators are elective, but the judiciary appointive. There are, however, city magistrates and justices of the peace who are elected. Both for civil and criminal cases there are courts of first and second instance; there is a Court of Appeal at the capital of each State and a Supreme Court at Rio de Janeiro.

Finance.—The following figures, taken from the *Statesman's Year Book*, show in milreis revenue and expenditure (provisional for 1894-96 and estimates for 1897), according to official reports, balances from former year being omitted on both sides; the statistics for revenue do not include balance of deposits, proceeds of loans, and issues of nickel and paper money:

	1891	1892	1893
Revenue.....	228,945,070	227,607,092	259,850,981
Expenditure.....	220,592,463	279,180,219	291,311,070
	1894	1895	1896
Revenue.....	226,484,615	300,725,297	344,989,371
Expenditure.....	370,668,341	275,691,670	393,403,914
	1897		
Revenue.....	339,307,000		
Expenditure.....	313,169,790		

In the budget for 1898 the revenues were estimated at 344,197,000 milreis and the expenditures at 324,570,264; of the revenue import duties were estimated to amount to 250,000,000 milreis, and of the expenditure it was estimated that the department of finance would use 139,062,923. Among the other sources of revenue are railways (34,000,000 milreis), stamps, post and telegraphs, tobacco, duties, lottery taxes. The following statistics for the first six months of 1898 are derived from a report of the Brazilian director of public revenue. The customs amounted to 119,161,180 milreis, being 3,742,896 milreis less than the receipts for the first six

months of 1897, and 23,302,261 milreis less than the receipts for the corresponding months of 1896. The internal revenue receipts for the first half of 1898 and the two preceding years were: 1898, 5,984,314 milreis; 1897, 6,659,984 milreis; 1896, 8,579,018 milreis. The value of the gold milreis in United States currency is \$0.546.

The public debt in milreis on December 31, 1896, was reported by the Minister of Finance.

Internal, in paper and gold.....	635,698,500
External.....	313,447,333
Paper money in circulation March 31, 1897.....	371,641,023
Bank notes.....	340,714,370
Floating debt.....	274,278,081
Guaranteed debts	6,893,500
Total.....	1,942,672,807
Later debt,—Western Minas loan..... (£3,710,000)	34,189,926
Total.....	1,976,862,733

On the foreign debt the rate of interest varies from 4 per cent. to 4½ per cent., and on the internal funded debt from 4 per cent. to 6 per cent. The funded debts of the States in 1895 aggregated 85,027,659 milreis, and the floating debt 6,679,077 milreis, making a total of 91,706,736.

The Congress has undertaken to reduce paper circulation—which at the end of 1895 amounted to 683,702,000 milreis and at the end of 1896 to 712,355,394 milreis, by withdrawing notes, in 1897, at the rate of 10 per cent.; in 1898, 15 per cent.; and in 1899, 20 per cent. The amount of coin in circulation is small. In 1898 Brazil declared its intention of raising to 18 pence the greatly depreciated value of the milreis, which at par is worth 27 pence. The milreis was depressed by the introduction of forced currency until it had sunk to 6 pence, i. e., 100 gold milreis were worth 450 in paper. In 1888 the paper milreis was still at par (27 pence or \$0.5462), but declined so that in June 1898 it was worth \$0.147; it has a long way to travel in order to reach the desired valuation of 18 pence, or \$0.3653. Brazil adopted the gold standard in 1849.

Army and Navy.—In 1897 the standing army numbered 28,160 men, including about 4,000 officers; these comprised: 40 battalions of infantry, with 1 transport company and one depot company; 14 regiments of cavalry; 6 regiments of horse artillery and 6 battalions of foot artillery; 2 pioneer battalions of engineers. Since 1875 service in the army has been compulsory; three years are required in the active army and three in the reserve. About 20,000 men constitute the police force.

At the beginning of 1898 the navy was reported to consist of 2 third-class battleships; 1 first-class cruiser, 3 second-class cruisers, 2 third-class cruisers, and 10 smaller vessels classified as cruisers or gun-boats; 6 coast defense vessels, five of which are river monitors of from 340 to 470 tons; 8 first-class and 6 third-class torpedo boats, and small vedette craft. It was decided to increase the navy with 6 cruisers, 8 destroyers, 2 port-defense vessels, 6 first-class torpedo boats, and 2 submarine boats of the Goubet type. The cruiser *Almirante Abreu*, which was building, and the second-class cruiser *Amazonas* (3,600 tons) were sold to the United States just before the outbreak of the Spanish-American war. The following gives the classifications and displacement of some of the larger vessels: *Riachuelo* and *24 de Maio*, third-class battleships, 5,700 and 4,950 tons respectively (these vessels are English built, were completed in 1884 and 1885, are double turreted, and are protected with a steel-faced belt of armor having a maximum thickness of 11 inches); *Almirante Tamandare* (built in Brazil in 1890) and *Barroso* (built in England in 1896), second-class cruisers, 4,735 and 3,600 tons respectively; *Benjamin Constant*, third-class cruiser, 2,750 tons. The naval complement comprises about 8,900 officers and men. There are five naval arsenals at Rio de Janeiro, Bahia, Para, Pernambuco, and Ladario de Matto Grosso.

Industries and Commerce.—Although but a small portion of Brazil is under cultivation, it is essentially an agricultural country; it has immense resources in its forests and mines, both of which are yet but little worked, and manufacturing industries are increasing. Coffee is the chief product and other important ones are sugar, tobacco, cotton, rubber, timber, cacao, mate, nuts. The State of Pernambuco is prominent for its sugar production and in 1849 yielded 2,458,297 bags (175 kilos., 165 pounds); in Pernambuco are about 30 sugar factories showing an average capacity of about 160 tons of cane a day. The cattle industry flourishes in Rio Grande do Sul; cattle killed in 1895 numbered 280,000; in 1896, 215,000; in 1897, 320,000. There are in this State tanneries, breweries, canning factories, and evaporators. The production of rum and alcohol is increasing. The following figures regarding the coffee industry

were reported by United States Consul-General Seeger, for the fiscal year ending June 30, 1898:

Rio de Janeiro, per railroad, ship and in transit.....	598,949,428 pounds
Santos.....	812,142,408 "
Victoria (estimated).....	52,800,000 "
Bahia (estimated).....	33,000,000 "
Ceará (estimated).....	2,640,000 "
Total.....	1,499,531,836 pounds

Shipments to foreign countries were as follows:

Europe.....	770,233,776 pounds
United States.....	625,746,216 "
Cape of Good Hope.....	19,707,600 "
La Plata region, etc.....	13,402,356 "
Total.....	1,429,107,948 pounds

At an average price of \$8.75 a bag (60 kilos., 132 pounds) this export was valued at \$96,450,716. During the three calendar years preceding 1898 the coffee export was as follows:

	1895.	1896.	1897.
From Santos.....	3,554,696 bags	4,156,567	5,621,762
" Rio de Janeiro.....	2,763,720 "	2,784,958	4,066,734
" Victoria.....	307,438 "	273,255	372,221
" Bahia.....	264,775 "	260,981	292,480
" Ceará.....	20,202 "	6,000	6,568
Total.....	6,910,831 bags	7,418,761	10,359,765

The number of bags for the year ending June 30 1898, was 11,360,173. The great increase in production, shown by these figures, was brought about by an immense increase in the areas given to coffee cultivation. As a result prices fell heavily in 1898, bringing great discouragement to the planters. The crop for 1898-99 is sure to be much smaller than that of the preceding year, the official estimate being 7,000,000 bags and the commercial estimate 9,000,000.

Coal is mined in Rio Grande do Sul; the output in 1895 was 11,012 tons; in 1896, 18,300 tons. In Minas Geraes there are six prominent gold mines; five are controlled by English companies and one by a French company. Bahia also possesses gold and, in addition, silver, copper, zinc, lead, iron, manganese, mercury, and other minerals. Diamonds are found in Brazil, but their exploitation is not as remunerative as it was formerly.

About 100,000 milreis are invested in the cotton factories of Brazil, of which there are about 155, 43 of them being in the State of Rio de Janeiro and 35 in Minas Geraes. The persons employed number 200,000. There are large woolen factories in several States and in Rio de Janeiro two large flour mills and a silk mill.

The chief exports are coffee, sugar, cacao, rubber, and products of the herds of Rio Grande do Sul. The principal imports are cotton, woollens, iron and machinery, coal, flour and other provisions, wines and spirits. Import duties are very high, sometimes being from 80 to 120 per cent. of the value of the imports; on tools, machinery, agricultural implements, etc., the tax is small, but is very high on spiritous liquors, tobacco, matches, cotton, drugs, light cloths, and preserved provisions. The total value of exports from Brazil for 1896 is placed at 480,000,000 milreis, and of imports at 481,000,000 milreis.

Shipping and Communications.—In 1895 the merchant marine of Brazil comprised 189 steamers with a total net tonnage of 75,283, and 285 sailing vessels with a total net tonnage of 65,576. In December 1896, there came into force a law requiring all coasting and river vessels to be Brazilian. Companies engaging in such traffic under the Brazilian flag receive from the government subsidies aggregating about 2,810,000 milreis a year. The foreign shipping entered at Rio de Janeiro in 1895 and at that and other ports in 1896 was as follows: In 1895, at Rio, 1,460 vessels of 2,243,163 tons; in 1896, at Rio, 1,535 vessels with a total tonnage of 2,469,628; Pernambuco, 947 vessels of 1,181,247 tons; at Ceará, 308 vessels of 236,091 tons; at Maranhao, 174 vessels of 223,647 tons; at Rio Grande do Norte, 207 vessels of 51,890 tons—total for 1896, vessels, 3,171; tonnage, 4,162,503.

In 1896 Brazilian railways had a total mileage of 8,086; 5,403 miles were in process of construction, 4,670 were under survey, and 8,440 miles were to be surveyed. Of the lines in operation, 1,832 miles were Union lines, 3,000 miles under control of the

States, 2,259 were subventioned, and 995 non-subventioned. Upon the capital of most railways constructed the government has guaranteed interest usually at six or seven per cent. At the beginning of 1895 Union lines had cost in all 257,674,937 milreis, and the deficit paid out of the Federal treasury had amounted to 11,118,481 milreis. A law which authorized the leasing of government railways was promulgated in December 1896. The following statistics on Brazilian railways are taken from the extensive report of Mr. Frank D. Hill, United States Consul at Santos, under date of December 20, 1897. On December 31, 1896, the following railway lines were open to traffic and in process of building:

Railways.	Open to traffic.	Under Construction.
Federal government lines.....	1,982 miles	
Subventioned lines (subject to government inspection)	2,430 "	3,699
Lines not subventioned.....	990 "	384
Lines operated by the State.....	3,260 "	880
Total.....	8,662 miles	4,963

The effective capital of the 1,982 miles of government lines was 324,733,121 milreis (paper), or \$45,462,637 in United States currency. In 1895 the telegraph lines had a total mileage of 10,143, with 21,936 miles of wire and 289 officers; the receipts for 1897 were estimated in milreis at 3,600,000 and the expenditures at 9,844,722. In 1893 there were 2,826 post-offices.

Religion and Education.—Under the Empire the State church was Roman Catholic, but under the Republic Church and State are separate and all faiths are granted equal toleration; the Catholic ecclesiastics, however, receive appropriations from the government. The ratio of Catholics to non-Catholics in the State of Rio de Janeiro is about 100 to 1. "Brazil constitutes an ecclesiastical province, with a metropolitan archbishopric, the seat of which is at Bahia, 11 suffragan bishops, 12 vicars-general, and 2,000 curates. For the private instruction of the clergy there are 11 seminaries."

Public instruction is classified as primary, secondary, or preparatory; and scientific, or superior. Primary instruction, which is free but not compulsory in the States is controlled by State and municipal authorities and in the Federal district by the municipality. Few reliable data on public instruction from the States have been obtainable, but in 1889 it was officially reported that the public and private primary schools numbered 7,500 and the pupils in attendance 300,000. Secondary schools are private or are controlled by the States, and two, known jointly as the National Gymnasium, are under the management of the central government; this Gymnasium confers a degree. Superior education is directed by the Federal government; it consists, in part, of four law, two medical, one polytechnic, one naval, and four military schools, and a school of mines. In 1890 there were in attendance at these schools 2,916 students. There is a Lyceum of Arts and Trades having about 2,300 students, and five other special schools with a total attendance of about 600. At Rio de Janeiro there is an observatory and a school for astronomy and engineering. The constitution provides that all education be under lay management. About 84 per cent. of the population are reported as "illiterates."

Recent History.—In November 1896, a violent rebellion broke out in Bahia among what were known as the negro "fanatics;" it was led by Antonio Condeilheiro, a man of the most unsavory reputation, but one who wielded immense power at the head of his five thousand religious enthusiasts. Their enthusiasm, however, which was ostensibly religious, expressed itself largely in atrocious deeds of rapine and murder. The insurrection created great alarm throughout the province of Bahia, which was one of the most populous of the Brazilian States. Measures were forthwith taken by the government to suppress the fanatics, who early in 1897 strongly intrenched themselves at Canudos. During the greater part of the year hostilities existed between the two forces; the movements of the fanatics extended to other States, and numerous engagements were reported of which, unfortunately, there were no absolutely reliable reports. An encounter was reported to have taken place on February 21, 1897, in a State of Minas, and on March 7 a government force was said to have been ambushed in the State of Bahia and almost annihilated. These affairs increased the alarm of the government, and resulted in the strengthening of both forces, the force of the rebels increasing to an estimated number of 15,000 and the government ordering 6,000 troops to suppress the insurrection; at the same time martial law was proclaimed in the State of Bahia. The excitement extended to Rio de Janeiro, where considerable damage was done by rioters. Another serious engagement was reported to have taken place on June 7, when General Arthur Oscar gained a decided victory over the fanatics, but suffered a loss to his own force of 300 in killed and wounded. It was said that this battle resulted in the fall of Canudos, the stronghold of the fanatics, but on July 6 a still more severe engagement was reported to

have taken place between the fanatics and the government forces numbering 5,000 men under General Savagit, who was later reinforced by General Oscar with 6,000 men. This battle also took place at Canudos and does not seem to have resulted in a decided victory for either side. The astonishing announcement was made that the government forces lost 2,000 men killed and that the loss of the rebels was 1,500. Another battle, which was the fifth, was reported on September 26; it was said that after great losses on both sides, the rebels were repulsed; and the next month news came that *Conseilheiro* had been taken prisoner. The number of casualties given above is probably about twice the actual number.

In the latter part of 1897 a plot was brought to light by the attempted assassination of President Moraes by a soldier named Mello on November 5. In attempting Mello's arrest, General Bittencour, the Minister of War, was stabbed and killed. No uprising followed, but the confessions of Mello revealed a plot of considerable magnitude against the government, and martial law being proclaimed, many of the alleged leaders were arrested, most of whom, however, were released when investigation had been made, but some of the opposition leaders belonging to the Jacobin party were found guilty and were exiled.

Two other events aroused some comment in the latter part of 1897. The one was the assassination of a number of Italians by a company of Jacobins in November; this threatened to lead to international complications, but satisfactory explanations were made to the Italian embassy and a crisis thus averted. The other event was brought about by the action of the Congress in December, which adopted a new tariff schedule that seemed to involve needless changes and to be disadvantageous to Brazilian commerce.

Events of 1898.—The successful disclosure of the Jacobin plot and the punishment of the conspirators discouraged any insurrectionary movement which might very likely have taken place at the presidential election on March 1, 1898. Senhor Campos Salles was elected President to succeed Senhor Moraes. The new President was the governor of Sao Paulo, one of the most important States in Brazil; he has been of great service to the republic and is known to have held democratic ideas during the time of the empire. The Vice-President, Senhor Rosa e Silva, is represented as being an able man and as having achieved distinction in one of the cabinets of Dom Pedro.

Among the other events of the year may be noted the official statement made by the President upon the opening of Congress to the effect that payments on the foreign debt had been punctually made but at considerable cost owing to the political disturbances and the fall in the rate of exchange and in the price of coffee. An arrangement with a number of native and foreign banks for the guarantee of the conversion into 5 per cent. currency bonds of the 4 per cent. gold loan of 1890 was announced in June. A treaty was signed with France leaving the adjustment of the boundary dispute between Brazil and French Guiana to the arbitration of Switzerland and the ratifications relative thereto were exchanged on August 5.

BREMEN is a State and free city of Germany situated on the Weser about fifty miles from its mouth, and having a population in 1895 of 196,404 nearly all Protestants. Its commerce is very extensive, including trade with European countries, the United States of America, West Indies, Africa, East Indies, China, and Australia. A large number of emigrants are shipped from this port to the United States. The number of ships belonging to the State on December 31, 1896, was 313. There were 47 steamers belonging to the "North German Lloyd" navigation company which plied between Bremen and ports in North and South America, Eastern Asia and Australia. There were also 35 steamers belonging to the "Hansa" company and 29 to the "Neptune" company. In 1896 the value of the imports amounted to 821,472,143 marks (the mark being valued in United States gold at 23.8 cents), and the exports to 809,364,692 marks, a great increase as compared with the year 1858 when the imports were valued at \$41,185,000 and the exports at \$40,000,000. The United States Consular Reports for 1898 refer to the great progress in building that has recently been made in Bremen. The American merchants have not taken advantage of the demand for American goods as fully as they might, but in some branches the imports from the United States show a tendency to increase. This is especially true of the American pine and hard woods on account of the extensive building. Cotton is the most important article of import in Bremen, the trade in this article being more than double that of Hamburg and showing a constant tendency to increase.

BRICE, CALVIN STEWART, ex-United States Senator, died in New York City, December 15, 1898. He was born at Denmark, Ohio, September 17, 1845. At the outbreak of the Civil War he was a student at Miami University, Oxford, Ohio, and he enlisted in a university company but in the fall reentered college. He enlisted again in April 1862, in a similar company in the Eighty-sixth Ohio Infantry, serving during the summer in West Virginia, and again returned to Miami where he was graduated in June 1863. He went to Lima, Ohio, taught in the public schools, and

in 1864, having recruited a company, once more entered the Union service, as captain in the One Hundred and Eightieth Ohio Volunteers. He was attached to the Twenty-third Army Corps and served to the close of the war in Tennessee, Georgia, and the Carolinas. In 1865 he entered the law department of the University of Michigan and the next year was admitted to the bar in Ohio and was engaged in active practice until 1880. From 1876, when he was a presidential elector on the Tilden ticket, he was prominent in the Democratic party. He was a presidential elector again in 1884 and delegate-at-large to the Democratic national convention of 1888 and the next year was made chairman of the national committee. In March, 1891, he entered the United States Senate, succeeding Henry B. Payne. Though debating little he was prominent in the Senate, and in 1893-95 was chairman of the committee on Pacific railroads; later he was made chairman of the reorganization committee of the Union Pacific railroads. Mr. Brice acquired interests in a large number of railway and business corporations and devoted his attention largely to these after his retirement from law practice in 1880; among them may be mentioned the following companies: Lake Erie and Western; New York, Chicago, and St. Louis; Chicago and Atlantic; Ohio Central; Richmond and West Point Terminal; Richmond and Danville; South Shore and Atlantic; Virginia and Georgia; and the Knoxville and Ohio; also the Chase National Bank of New York, the Southern Trust Company, the United States Express Company, and the National Telegraph Company. His interests in corporations probably began when he and his law associates brought about the construction of the "Nickel Plate" railroad paralleling the Lake Shore. At the time of his death Mr. Brice was president and a director of the Duluth, South Shore, and Atlantic railway, the Lake Erie and Western railway, the Cincinnati, Jackson, Mackinaw railway, the Pacific Mail Steamship Company, and a director of a large number of other organizations. During the last months of his life he was interested in the construction of a railway from Hong Kong through Canton to Hankow on the Yang-tse-kiang. Mr. Brice's legal residence was Lima, Ohio, but he lived mostly in New York, Washington, and Newport.

BRICKS. See CLAY.

BRIDGES. The advance in bridge engineering during the past few years has been chiefly in better design and construction. Metal bridges are built with greater solidity and strength throughout than formerly; riveted connections and stronger details generally are employed; steel is the material now almost universally used; shopwork is more perfect and reliable, and the facilities for rapid and accurate erection are better. Greater durability has resulted from the increase in strength and weight. The various designs for bridges across the Hudson and East Rivers at New York, the St. Lawrence River at Quebec and Montreal, the Detroit River at Detroit, the Mississippi River at New Orleans and elsewhere have carried the possibilities of long spans beyond long accepted limits. Spans of over 3,000 ft. for suspension bridges are now regarded with confidence. In drawbridge construction there has been a notable development in the use of bascule spans where the waterways to be crossed are restricted in width and the land bordering their banks is costly. In masonry bridges the two most notable advances are the use of three-hinged arches and the development of various systems of combined concrete and metal construction. Wooden bridges are being replaced everywhere by structures in metal. Only the more notable typical bridges of the above types are mentioned here. Unless otherwise noted these bridges belong to the work of 1898. During this year many orders were received by American and European bridge manufacturers for bridges to be shipped to South America, South Africa, Japan, China and Asiatic Russia.

Arch Bridges.—A notable development in masonry arches has been the increasing use of concrete masonry. Concrete in which a skeleton of metal rods, beams, or netting is embedded is one of the systems of construction which has gained prominence. The largest structure of this type is the Topeka, Kan., bridge consisting of five 125 ft. spans, two 110 ft. spans, and two 97½ ft. spans. Each arch is of concrete in which are embedded 12 lattice girders of steel spaced 3 ft. apart and bent to the curve of the arch. Numerous shorter spans of this and other systems of concrete metal construction have been built in Europe and America. In constructing the extension of the West Highland Railway in Scotland many of the bridges and viaducts were built of concrete without metal skeleton. The longest single span employed was 127 ft., but most of them were 30 ft. and 50 ft. spans. The largest structure has twenty-one 50 ft. semicircular arch spans, and a length of 1,248 ft. Hinged arches of concrete have been built in considerable numbers in Europe. The hinges are sometimes true hinges of metal or stone placed at crown and abutments, and sometimes are simply joints of lead placed at crown and abutments and often, also, at the quarter points. The following are the most important hinged concrete arches actually built: Railways, Saxony, span 42.64 ft. rise 9.84 ft., thickness of ring 1.64 ft. to 1.96 ft., hinges sandstone with convex surface and concave bearing, built 1880; Munderkingen, Wurtemberg, span 164 ft., rise 16.4 ft., arch ring at crown, 3.28 ft.

thick, hinges of steel at crown and abutments, built 1893; Richtenstein, Württemberg, span 75.44 ft., hinges, lead joints at crown and abutments, built 1893; Inman, Hohenzollern, span 98.43 ft., rise 9.84 ft., hinges granite bushed with sheet lead, built, 1896. These bridges have given excellent service and developed no cracks. None were built in 1898.

Metal arches of unusual size have been built in the United States and Europe during the year. The two-hinged steel arch replacing the Niagara Falls and Clifton suspension highway bridge at Niagara Falls has a span of 840 ft. which is the longest in the world. The Grand Trunk Railway bridge located just below has a span of 550 ft., and is a double deck structure carrying a highway and two railway tracks. The notable features are: The inclination of the arch ribs toward the centre axis of the bridge at the crown; the use of riveted connections throughout with all bracing made up of stiff members, and the arrangement of the end shoes so as to form practically a pin 9 ft. in diameter and with roller friction. This bridge was completed in 1897. The Schuylkill river bridge in Fairmount Park, Philadelphia, has four 302 ft. arch spans. Two-hinged arches, with riveted connections and stiff bracing, were employed. The Alexander III bridge at Paris has a span of 352.6 ft. a rise of 20.6 ft. and a width of 131.2 ft. This is a three-hinged structure with solid web cast steel arch ribs. (See succeeding paragraph on Foundations). A parabolic open web arch with a span of 547.6 ft. was built at Muengsten, Prussia. A peculiar feature of this arch is that its lower panels are built into and form a part of the steel trestle towers or piers at the end of the arch. An open web arch of 380 ft. span forms a part of the new Kornhaus Bridge near Berne, Switzerland. The Bonn bridge across the Rhine in Germany has one arch of 614 ft., and two of 307 ft. each, and the Düsseldorf bridge over the same river two main arches of 594 ft. square each. Both of these were completed in 1898. The viaduct across the Viar river in France put under construction this same year has a centre arch of 721.6 ft. span.

Cantilever Bridges.—The first bridge of this type was built across the Niagara river in 1883; the longest is the Firth of Forth Bridge in Scotland with two 1,700 ft. spans; the longest in the United States is the Memphis bridge of 790½ ft. span. No notable bridges of this type were actually built during the year, but spans are projected as follows: Hudson river at New York, 2,100 ft.; Detroit river at Detroit, Mich., 1,300 ft.; Mississippi river at New Orleans, 1,000 ft.; St. Lawrence river at Montreal, 1,200 to 1,312 ft.; St. Lawrence river at Quebec, 1,440 ft. None of these structures has advanced beyond the preliminary plans.

Draw Bridges.—The majority of draw bridges built in recent years have been either swing spans or bascule spans, other forms being employed in isolated cases only. The swing span is still the form most used except in crowded cities and under special conditions, but undoubtedly the greatest development of the past few years has been in draw bridges of other forms. Of these some form of bascule span is the favorite with engineers at the present time. Notable bridges of this form have been built in Chicago, Milwaukee and Buffalo in this country. An 8-track bascule railway bridge is planned to cross the Drainage Canal in Chicago, and a six-track railway span of the same form is being erected at Boston. The Tower Bridge across the Thames river at London, England, having an opening of 200 ft., is the longest bascule span ever built and the Interstate Bridge, with a span of 520 ft., at Omaha, Neb., is the longest swing span. No very notable swing spans have been built during the last two years.

Foundations.—Among the notable bridge foundations of recent years those for the New East River Bridge in New York and the Alexander III Bridge in Paris are particularly noteworthy. The first mentioned work consists of both tower foundations and anchorages, the former for the Brooklyn tower being the most remarkable. These consist of two timber caissons each 63x79 ft., placed with their longer sides parallel and 97.5 ft. apart c. to c., and each carrying a masonry pier. The caisson for the south pier is 39 ft. high, contains 58,800 cu. ft. of timber and 86 tons of iron and weighs about 1,557 tons. It was sunk in 60 ft. of water. The cofferdam surmounting the caisson was 50 ft. high increasing the total weight to 1,960 tons. For the north pier the caisson was of the same lateral dimensions but it was 53 ft. high not including 50 ft. of cofferdam. This caisson contained 74,700 cu. ft. of timber, weighed 1,965 tons exclusive of the cofferdam, and was sunk in something less than 60 ft. of water. Bed rock was struck at a depth of 107½ ft. below water which with but one exception is the greatest depth ever reached by a caisson sunk by the pneumatic process. The caissons for the New York tower are similar but of slightly different dimensions, and both were practically finished in 1898. See succeeding paragraphs on Suspension Bridges.

The Alexander III bridge in Paris had for its abutment foundations two steel caissons each 144x110x31.7 ft. deep, which are the largest steel caissons ever sunk. Owing to the extended area of roof to be supported the working chamber of the caisson was divided into five great communicating compartments, each 144 ft. long,

by four lines of interior supports spaced 31½ ft. apart. The surface area of each caisson was 15,860 sq. ft. The working chamber was 6.23 ft. high in the clear and was surmounted by a roof of lattice girders 5.21 ft. deep, a covering of steel plates being riveted to the under sides of the upper chord of these girders. The exterior of the caisson was made of plates and cover plates each 6 mm. thick, the plates being 6.23 ft. high and 3.93 ft. wide. Above these were plates 4 mm. thick for 5 ft. and 3 mm. thick above that. There were two air lock shafts to each compartment or ten in all for each caisson. See preceding paragraph on Arch Bridges.

Suspension Bridges.—The longest span suspension bridge upon which construction has actually been begun since the completion of the New York and Brooklyn Bridge in 1883, is the New East River Bridge which will cross the East River between Manhattan and Brooklyn in New York City. This bridge will be located about two miles above the Brooklyn Bridge and it will have the following leading dimensions: Clear span, 1,600 ft.; length between terminals, 7,200 ft.; total width, 118 ft.; clear height for 100 ft. each side of centre 135 ft.; height of towers, 335 ft.; capacity, 4 trolley car tracks, 2 elevated railway tracks, 2 carriage ways, and 2 footwalks: four cables 17½ in. diameter of 19 strands of parallel 0.203 in. diameter steel wire; towers, masonry to 20 ft. above water, steel above. The platform will be carried by four riveted steel trusses suspended from the cables for the main span, but carried by the main towers and abutments and two intermediate towers for the shore spans. Work has been in progress since the spring of 1897 on the foundations which are being sunk by the pneumatic caisson process. (See preceding paragraph on Foundations.) The following are the chief points of difference between this bridge and the Brooklyn Bridge: The use of steel towers instead of masonry; the omission of all inclined stays; the support of the shore spans entirely independent of the cables; the use of riveted instead of pin connections for the trusses. Work on the steel superstructure will be begun in 1899.

The Lewiston & Queenston Suspension Bridge being built across the Niagara River at Lewiston, N. Y., has a clear span of 1,040 ft. between towers and of 800 ft. between the rocker bents at the ends of the platform. Its width is 28 ft. between trusses, and it will carry an electric railway and two carriageways. In constructing this bridge the cables removed from the old Niagara Falls and Clifton suspension bridge were re-employed. (See preceding paragraph Arch Bridges). It replaces a suspension bridge built in 1851, which was partly destroyed by a storm in 1864. This bridge will be completed in 1899.

The Covington and Cincinnati Suspension Bridge built by John A. Roebling in 1867 and, until the construction of the Brooklyn Bridge the largest and heaviest span of this type ever built has been strengthened and remodeled. The new work consisted in lengthening the approaches to reduce the grade; in constructing two additional cables with their anchorages, and in strengthening the platform construction. The new cables are 10½ ins. diameter made of 2,226 parallel 0.203 in. diameter steel wire and have a strength of 12,000 tons each. These cables are placed directly above and 6 ft. from the old cables, and the suspenders are attached to both the old and the new cables. Total cost of renewal \$650,000.

The Hudson river suspension bridges which have been proposed at various times call for spans of 3,000 ft. or over; the five most carefully worked out plans calling for the following dimensions:

Number of spans	1	2	3	4	5
Length land spans, ft.....	965	1,000	1,850	500	900
Length centre span, ft.....	5,220	3,200	3,100	3,310	3,200
Length between anchorages.....	5,150	5,200	6,800	4,310	5,000
Number of railway tracks.....	6	8	8	6	6
Load per lin. ft. lbs.....	3,000	1,500	3,000	3,000	3,000
Cost in millions of dollars.....	37	25	23	17	24

Surveys are being made for a third suspension bridge across the East River at New York.

Truss Bridges.—Several structures of note have been completed or put under way during the year. The Victoria Jubilee Bridge which replaces the Robert Stephenson tubular bridge across the St. Lawrence River at Montreal will have 24 spans of 254 ft. each and one span of 348 ft., all pin connected. Nearly 20,000 tons of steel were used in the new bridge as compared with 9,000 tons of boiler iron in the old tube. The Proposed Red River railway bridge in China for which French engineers have the contract will have a total length of 5,838 ft., divided into spans of 246 ft. with one span of 348 ft. The bridge to be built to carry the Central Asian Railway across the River Amu Daria in Russia will be nearly three miles long. Other truss bridges completed or under construction during 1898 are: Gray's Ferry Bridge, Philadelphia, Pa., with 26 spans, having an aggregate length of 1,650 ft.; Burnett

river bridge at Bundaberg, Australia, having eight lattice spans of 170 ft.; Charlestown bridge at Boston, Mass., having ten 85 ft. plate girder spans and a 240 ft. swing span, and the arch truss bridge of 25 spans of 65 ft. across the Manhattan valley in New York City.

BRIGGS, FRANK A., Governor of North Dakota, died at Bismarck, August 9, 1898. He was born September 15, 1858, in Hennepin county, Minnesota, near the present site of Minneapolis; was educated in the public schools and entered the newspaper business, becoming editor of the *Howard Lake Advocate*. In 1881 he went to North Dakota, having previously lived in Minneapolis. For eight years he was Treasurer of Morton county; was elected State Auditor in 1894 and Governor on the Republican ticket in 1896. Governor Briggs was well liked by the people, but on account of ill health he declined to have his name go before the Republican State convention for renomination.

BRIN, BENEDETTO, Italian Minister of Marine, died May 24, 1898. He was born in 1833; was educated at Turin, and having become a naval architect, soon gained distinction in the naval yards at Leghorn and at the Ministry of Marine. His reputation was increased by his construction of the great battleships *Dandolo*, *Lepanto*, and *Duilio*. Though it was as a naval architect that Signor Brin was pre-eminent, he was prominent as a statesman, being four times minister of marine and once minister of foreign affairs during the last twenty-two years of his life. It was said that, although he was an untiring lobbyist and controlled the majority of the votes in the Piedmontese deputation, he was a man of upright and generous character. He was loyal to the House of Savoy and to the Triple Alliance.

BRISSON, EUGENE HENRI, French Premier from June to October, 1898, is a well known statesman and a Radical Republican in politics. He was born at Bourges, July 31, 1835; was trained for the bar, but entered journalism, becoming a writer for the *Temps* and the *Avenir National* and becoming associated in 1868 with Gambetta, Allain-Targe, and Challemel Lacour on the *Revue Politique*. In 1871 he entered the Chamber of Deputies as a leader of the extreme left. He was a supporter of the colonial policy initiated by Jules Ferry. He was Vice-President of the Chamber of Deputies in 1879, and succeeded Gambetta as President in 1881, the latter becoming Premier. He was elected to the same office in 1894 and 1897; he retained the presidency from 1891 to 1895, when he succeeded Gambetta as Premier. On January 17, 1897, he was defeated for the presidency of the Republic by the late Felix Faure. M. Brisson has a praiseworthy record in French politics. For an account of the Brisson ministry in 1898, see FRANCE.

BRISTOL, one of the chief seaports of England is situated at the junction of the rivers Frome and Avon and partly in the counties of Gloucestershire and Somerset. Its population in the middle of the year 1897 was estimated at 232,242. It is the seat of an important college which in 1897 had a teaching staff of 56 and was attended by 583 students, including those attending evening classes. In 1896 the total tonnage of vessels entered and cleared excluding coastwise shipping, was 1,108,782. Since 1885 it has been represented by four members in Parliament. The municipal government is vested in a mayor, board of aldermen, town councillors, a lord lieutenant and a lord high steward. For an account of the trade union congress held there in 1898, see TRADE UNION, CONGRESS OF.

BRITH ABRAHAM ORDER, a fraternal society, founded in 1859. It has one grand lodge, 229 sub-lodges, and 15,461 members. Since its organization it has disbursed \$1,281,787 and \$82,200 during its last fiscal year. Samuel Doef, New York, Grand Master; Robert Strahl, Brooklyn, First Deputy Grand Master; Anson Stern, Boston, Second Deputy Grand Master; Leonard Leisersohn, New York, Grand Secretary; and Samuel Wolf, Brooklyn, Grand Treasurer.

BRITISH AND FOREIGN ANTI-SLAVERY SOCIETY, founded in 1839 for the "universal extinction of slavery and the slave trade; and the protection of the rights and interests of the enfranchised population in the British possessions, and of all persons captured as slaves." Patron, H. R. H., the Prince of Wales; Secretary, Travers Buxton, 55 New Broad street, London, E. C.

BRITISH ARMY. See GREAT BRITAIN.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, Burlington House, founded in York in 1831, at the suggestion of Sir D. Brewster to stimulate scientific inquiry and to promote intercourse among scientific men. There are ten sections: (a) Mathematics and Physics; (b) Chemistry; (c) Geology; (d) Zoology; (e) Geography; (f) Economic Science and Statistics; (g) Mechanics; (h) Anthropology; (i) Physiology; and (k) Botany. Each section has its president, secretaries, and committee. The Association meets annually. The last meeting, held at Bristol in September 1898, attracted 2,500 men of science under the presidency of Sir William Crookes, who showed by calculations that the amount of fixed

nitrogen is insufficient to meet the increasing demands made upon it by the production of wheat and proved that unless chemists discovered some way to fix the nitrogen of the atmosphere, a universal wheat famine would occur in the next century. The rest of his address treated of new cases—wireless telegraphy, the Röntgen rays, radiant matter spectroscopy, and psychic research. Prof. Ayrton described new researches in the physics of smell. Other interesting and valuable papers were read, among them the sensational adventures of M. de Rougemont, describing his alleged enforced exile of 28 years among cannibals in the Cambridge Gulf region of unexplored Australia. Prof. Petrie lectured on *Egypt under the First Three Dynasties in the Light of Recent Discoveries*. The Association will meet in Dover in 1899; in Bradford in 1900; and in Glasgow in 1901. President-elect, Prof. M. Foster, F. R. S.; Secretary, C. Griffith, Burlington House, London, W. See BOTANY (paragraph Botanical Societies.)

BRITISH CENTRAL AFRICA is that portion of Southern Africa which lies in the interior of the continent between Portuguese East Africa on the east and Angola on the west, having an area of about 251,000 square miles and a native population of about 650,000. British Central Africa proper has been since 1891 under the jurisdiction of the British South Africa Company, (q. v.) and is thus to be reckoned as a part of Rhodesia (q. v.). The European portion of the population is scanty, numbering between 300 and 400. A great part of the territory is uninhabited. Among the chief towns are Fife, Abercorn, Rhodesia, Niamkolo, Sumbu, and Fort Rosebery. The most populous portion of the territory is under British administration. The South Africa Company maintains a representative in this region.

BRITISH CENTRAL AFRICA PROTECTORATE is the district which lies on the southern and western shores of Lake Nyassa extending from that lake to the Zambesi. In 1891 this tract was set apart as a protectorate, while the adjoining territory, known as British Central Africa proper, passed under the jurisdiction of the British South Africa Company. The area of the Protectorate is placed at 38,000 square miles with a population in 1897 estimated at 844,995 natives and 300 Europeans. The principal town is Blantyre, which is the seat of an important mission. Other towns are Zomba, Chiromo, Port Herald, Fort Anderson, etc. Considerable progress has been made in recent years in the building of roads. Coffee planting has become an important occupation and it was estimated in 1896-7 that about 2,000 acres had been cleared and planted. Rice and wheat are also successfully cultivated and in certain parts of the country oats and barley are raised. The principal exports are ivory and coffee. To maintain order an armed force composed of about 200 Sikhs from the Indian army and a larger body of native troops is supported by the government. There are also gunboats on the rivers Zambesi and Shiré and on Lake Nyassa. By these means the efforts to protect life and property have been fairly successful. This region has been the scene of constant conflict with the slave traders. Missionary work has been actively carried on. Communication with the coast is afforded by means of the rivers but a more direct line will be opened when the railroad from Mombasa is completed. Post-offices have been established and a telegraph line is in process of construction.

BRITISH COLUMBIA. See COLUMBIA, BRITISH.

BRITISH GUIANA, a colony of Great Britain on the northeast coast of South America, comprising the settlements of Demerara, Essequibo, and Berbice. Its area, including the Venezuelan claim, is 109,000 square miles; population (1896-97), 285,315, the registered electors numbering 2,416. The capital, Georgetown, had (1891) 53,176 inhabitants. The government consists of a Court of Policy of seven official and eight elective members, a Combined Court comprising, besides the above, six elective financial representatives, and a governor (Sir Walter Joseph Sendall, K. C. M. G., being appointed in 1898 at a salary of £5,000). The Combined Court deals with matters of expenditure and methods of meeting it, and alone can levy taxes. Civil procedure is based on the Roman-Dutch Law, and the criminal on that of Great Britain. In the 209 schools there are about 28,300 pupils; these schools received (1896-97) a government grant of £20,883. Statistics of finance:

	1894-5	1895-6	1896-7
Revenue	593,285	567,749	555,774
Expenditure	566,833	596,493	590,616
Exports	2,039,901	1,769,500	1,899,457
Imports	1,668,750	1,443,553	1,341,710

The more important sources of revenue in 1896-7 were: Customs, £294,671; licenses, £108,859; rum duty, £49,780; royalty on gold, £23,902. Expenditures: Civil establishment, £156,718; judicial, £37,854; education, £31,431; public works, £23,800; ecclesiastical, £22,586. The public debt (1896-97) was £865,235. The more important

Exports (1896-97) were: Sugar, £1,098,398; gold, £466,143 (126,507 oz.); rum, £136,927; molasses, £20,926. Imports for same period: Rice, £131,458; flour, £103,956; dried fish, £53,652; oils, £29,478; pork, £26,739; lumber, £22,172; butter, £19,908. Exports to Great Britain (1896-7) amounted to £964,248, to British colonies, £55,670, to other countries, £879,538; the corresponding imports for the same period were respectively £783,697, £196,601, and £361,412. It is seen that sugar is the chief product; of the 79,278 acres under cultivation in 1891, 69,814 acres were used for that crop. The registered tonnage for 1897 was: Steam, 15 vessels of 1,171 tons; sailing, 121 vessels of 5,541 tons. Gold mining, which began in 1886, is a prosperous industry. Up to 1896 the returns aggregated £2,796,300; in 1895 there were mined 122,936 oz.; in 1896, 123,759 oz. The country has 70 post-offices, 36 of which are money order offices, and 42 telegraph offices with a total of about 546 miles of wire. There are 38¾ miles of railway and 450 miles of river navigation.

BRITISH HONDURAS, or **BALIZE**, a Crown colony of Great Britain on the Caribbean Sea east of Guatemala, has an area of 7,562 square miles and an estimated population (1896) of 33,811, of whom less than 500 are whites. Balize is the capital and chief town (pop. about 7,000). The colony is administered through a Governor (Colonel Sir David Wilson, K. C. M. G., in 1898) and an executive and a legislative council. The revenue for 1895 and 1896 was \$238,483 and \$302,686 respectively; the expenditure for the same years was \$274,767 and \$269,877. Revenue is mainly derived from customs duties, excise, etc., and expenditure is chiefly for administration. The public debt in 1896 was \$168,815. The principal products are mahogany and logwood; coffee and tropical fruits are cultivated. The exports for 1895 and 1896 amounted respectively to \$1,284,000 and \$1,378,601; the imports for the same years were valued at \$1,453,640 and \$1,462,637. In 1896 there entered 576 vessels of 178,199 tons, and cleared 562 vessels with a total tonnage of 170,867. In 1894 the United States gold dollar became the standard of value. The right of occupation by British settlers was formally acquiesced in by the Spanish authorities in 1798, but it was not until 1862 that Balize became a Crown colony. It was contended by some in discussing the Nicaragua Canal question that by establishing this colony England violated the Clayton-Bulwer treaty and that consequently this treaty is no longer binding on the United States. See **NICARAGUA CANAL**.

BRITISH MEDICAL ASSOCIATION, founded in 1832, has now over 18,000 members, 38 branches in the United Kingdom and 32 Colonial branches. The society publishes the *British Medical Journal*. Secretary, Francis Fowke; office 429 Strand, London, W. C.

BRITISH MUSEUM, Great Russell street, Bloomsbury, London, founded in 1753 opened 1759, has from time to time made so many additions that it now occupies thirteen acres. Originally it was composed of three departments: MSS., Printed Books (including coins, medals, points, and drawings), and Natural History. The Printed Book Department now contains about 2,000,000 books and receives a copy of every printed book published in the United Kingdom. The annual increase amounts to about 46,000 volumes, not including continuations, music, and newspapers. The National Library is the finest and most extensive collection of English literature in the world, and has the best library of every European language and literature outside of each individual country in Europe. In 1897 the number of visitors to the Museum (not including regular readers), was 586,437, the average daily number equalled 1,686, visitors to the reading room numbered 188,628. Some fine additions were made in 1898 to the Prints and Drawings Department. Officers for 1899, Sir Edward Maunde Thompson, K. C. B., Director and Principal Librarian; John T. Taylor; Assistant Secretary, and John C. Cleave, Accountant. Keepers: R. Garnett, printed books; E. J. L. Scott, MSS.; R. K. Douglas, Oriental MSS.; E. A. W. Budge, Egyptian and Assyrian Antiquities; A. S. Murray, Greek and Roman Antiquities; C. H. Read, British, Mediaeval and Ethnological Antiquities; Barclay V. Head, Coins and Medals; and Sidney Colvin, Prints and Drawings.

BRITISH NAVY. See **GREAT BRITAIN**.

BRITISH NORTH BORNEO. See **BORNEO**.

BRITISH SCHOOL AT ATHENS. See **ARCHÆOLOGY** (paragraph Greece).

BRITISH SOUTH AFRICA COMPANY, THE, received a royal charter on October 29, 1889, granting it extensive administrative powers over a wide tract of country to the north of Cape Colony. This region is now locally known as Rhodesia (q.v.) and comprises the divisions of Mashonaland, Matabeleland, British Central Africa, and the Bechuanaland Protectorate.

The Company and the Jameson Raid.—Previous to the Raid, Dr. Jameson was the administrative officer, but was dismissed from his position afterwards. The unlawful use of the Company's forces to invade a neighboring and friendly state

led to the transfer of military control to the imperial government. In January, 1896, the Company's directors asked the government to make an inquiry into the circumstances of Jameson's Raid. This request was complied with. Toward the close of the session of 1896 the House of Commons appointed a committee of inquiry, but it did not meet until the last day of the session and merely recommended the appointment of a committee on the same subject when Parliament should be convened. When the House of Commons assembled in January, 1897, Mr. Chamberlain recommended the appointment of a select committee to "inquire into the origin and circumstances of the incursion into the South African Republic by an armed force and into the administration of the British South Africa Company and to report thereon, and further to report what alterations were desirable in the government of the territories under the administration of the Company."

The Inquiry; Testimony of Mr. Rhodes.—The inquiry was opened on February 16, and Mr. Rhodes was the first witness examined. His testimony was very important. He admitted freely his responsibility for the Raid. He said that for a long time previous he had sympathized with the discontent manifested by the Uitlander element in the Transvaal—a discontent caused by a corrupt administration of the government and by the denial of civil rights "to the majority of the population possessing more than half the land, nine-tenths of the wealth and paying nineteen-twentieths of the taxes in the country." The Uitlanders had sought in vain to obtain redress for these grievances by constitutional means. Apart from a natural sympathy with their cause Mr. Rhodes said that as a citizen of the Cape Colony he felt that the unfriendly attitude of the government of the Transvaal was the great obstacle to common action among the states of South Africa. "Under these circumstances I assisted the movement in Johannesburg with my purse and influence," he said, "Further acting within my rights, in the autumn of 1895 I placed on territory under the administration of the British South Africa Company, upon the borders of the Transvaal, a body of troops under Dr. Jameson prepared to act in the Transvaal in certain eventualities. I did not communicate these views to the Board of Directors of the British South Africa Company. With reference to the Jameson Raid I may state that Dr. Jameson went in without my authority." He added that his action had been largely influenced by the feeling that the government of the South African Republic intended to call in the aid or appeal to the protection of another power, meaning of course the German Empire. Upon cross-examination, Mr. Rhodes showed perfect willingness to accept the full responsibility for the action of his subordinates.

Other Evidence.—Other important evidence taken by the committee of inquiry included Dr. Jameson's admission that in making the Raid he had acted entirely on his own judgment; and it was his expressed belief that if he had succeeded he would have been forgiven. He also denied that he had ever said to any one that the British government was behind him in what he did. Dr. Rutherford Harris testified that in a conversation with Mr. Chamberlain he had made a guarded allusion to an intended revolution in South Africa, but Mr. Chamberlain in his version of the conversation said that Dr. Harris had started to give him some confidential information but Mr. Chamberlain had refused to receive it. The charge made by Mr. Labouchère that Dr. Harris had dealt in the stock of the Company for personal gain was withdrawn, Mr. Labouchère's informants having refused to appear. Certain telegrams which were said to implicate persons in high authority were withheld by Mr. Hawksley, the solicitor of Mr. Rhodes, acting under authority from the latter and the committee did not compel their production alleging as a reason the delay which would result, since Mr. Rhodes would have to be summoned from South Africa to testify.

Report of the Parliamentary Committee.—The report of the committee was presented on July 13. The points upon which Mr. Rhodes dwelt in his testimony were first, the influence of the Uitlander grievances upon his conduct, second, the statement that Dr. Jameson invaded the Transvaal without the authority of Mr. Rhodes, third, the concealment of his actions from the Board of Directors of the South Africa Company. As to the first of these points, the committee said that the grievances in no way justified the action of Mr. Rhodes and Dr. Jameson. Secondly, the fact that Dr. Jameson acted on his own authority was admitted, and thirdly, it was the opinion of the committee that Mr. Rhodes had concealed his views from the Directors of the British South Africa Company. Notwithstanding this latter fact, however, the Board was not free from responsibility. To it the Imperial government had entrusted wide powers and it was bound to watch with care over the administration of its territory. It had given to Mr. Rhodes a full power of attorney and permitted him to act as he chose without consulting the Board. The committee therefore held that the Board as then constituted was not fitted for the duties for which it had been created, although it was declared that the High Commissioner Lord Rosemead had done everything in his power to maintain the honor of his

country. Blame was laid upon the Imperial Secretary to the High Commissioner and the Resident Commissioner in the Bechuanaland Protectorate for their failure to explain to the Board Mr. Rhodes's intentions. As to any complicity of the officers in the Colonial Office, the committee declared that there was no evidence. They did not believe that Mr. Chamberlain or any other of the officers in the Colonial Office had foreknowledge of the Raid.

Responsibility for the Raid.—The general conclusions of the committee were that Mr. Rhodes had acted without jurisdiction in promoting the Raid. He had subsidized, organized and stimulated an armed insurrection against the government of a friendly state and, although Dr. Jameson invaded that state without orders, he was acting in accord with a general plan for which the responsibility rested on Mr. Rhodes. The latter had been guilty of a great breach of duty. He had deceived the High Commissioner and had concealed his views from the Colonial Ministry, and from the Board of the British South Africa Company. Furthermore, he had led his subordinates to believe that their plans were contemplated and approved by their superiors. A share in this responsibility was attached by the committee to Mr. Alfred Beit and Mr. Maguire who had contributed large sums of money to the revolutionary movement, and to Sir Graham Bower, Imperial Secretary to the High Commissioner, and Mr. Newton, Resident Commissioner of the Bechuanaland Protectorate for having withheld from the Commissioner information on the subject of the conspiracy. The Raid itself was condemned by the committee in unqualified terms. "The result," it said, "caused for the time being grave injury to British influence in South Africa; public confidence was shaken, race feeling embittered, and serious difficulties were encountered with neighboring states."

Results of the Inquiry.—Upon the reading of the report in the House of Commons a long debate took place. Some of the members blamed the committee for its failure to recommend specific steps with regard to Mr. Rhodes, and to report immediately to the House the refusal of Mr. Hawksley to produce the telegrams. Mr. Labouchère was prominent in this criticism of the action of the committee. The government replied that it belonged to them to say what action should be taken in regard to Mr. Rhodes and that in this action regard must be paid to the services which he had rendered to the Empire. In regard to the failure to produce the telegrams, it was urged that a prompt report from the committee was most needful and no report could have been made during the current session had the committee waited to procure the telegrams. It was declared that the government had no intention of prosecuting Mr. Rhodes, who though he had committed a great fault as a statesman, was a man of high personal honor. As to a reorganization of the British South Africa Company in such a way as would remove present abuses, it was said that a plan was already under consideration and it was hoped that a new government would be established for Rhodesia which would be satisfactory in all respects. The resolution censuring the committee was voted down.

To carry out the rest of the government recommendations in this matter, namely the investigation of the affairs of the Company and its methods of administration, Sir Richard Martin was directed to investigate the recent doings of the Company's administrative officers in South Africa. He inquired into the causes of the uprisings in Matabeleland and Mashonaland and as a result held the Company largely responsible for these occurrences (see RHODESIA). He also declared that the Company had transgressed its charter in making a certain concession to a Mr. Homan to the injury of other traders; that its administration went beyond its powers in withholding licenses from other white settlers; that Dr. Jameson's withdrawal of the police gave an opportunity for the rising. The Company replied to these and other charges at some length denying some of them specifically and in general declaring that it was not responsible for the alleged grievances of the natives.

Affairs of the Company in 1898.—The above review of the question of the Company's complicity in the Jameson's Raid, though it concerns the events of previous years, is given for the reader's convenience and for a better understanding of the status of the matter in 1898. It was announced by Mr. Chamberlain in February 1898, that the Company had reimbursed the government for the costs incurred in connection with the Jameson Raid and with the native revolt in Rhodesia with the exception of some trifling amounts. Early in May one of the members of Parliament referred to the conditions prevailing in the Company's territories and drew the government's attention to the necessity of establishing a better system of government there. It was said in the course of the discussion that the Company's administration was unsatisfactory and that Mr. Rhodes ought not to have been allowed to resume his seat on the board. There was no guarantee, said Sir William Vernon Harcourt, that the government's plans for the administration of the colonies would prevent a recurrence of the former evils and he declared that the real administrator of Rhodesia would, in future, be Mr. Rhodes. Mr. Chamberlain said that the

government's plans would absolutely prevent the recurrence of the mistake made by the Company's administration. On being asked in regard to the restoration of their commissions to the officers who had taken part in the Raid it was said that eight of the thirteen officers had been discharged at the instance of the Attorney-General as having acted merely in obedience to orders and that the rest were permitted to resign their commissions. While the government admitted that most of the latter were to some extent victims of circumstance, it could not allow this in the cases of Sir John Willoughby or Cecil Rhodes. Nevertheless after Parliament was prorogued his commission was restored to Col. Rhodes.

BROAD IRRIGATION. See SEWAGE PURIFICATION.

BRODERICK, WILLIAM ST. JOHN FREMANTLE, P. C. English Parliamentary Under Secretary of State for Foreign Affairs, was born in 1856, being the eldest son of the eighth Viscount Midleton. He was educated at Balliol College, Oxford, (1879). He was Member of Parliament for West Surrey from 1880 to 1885, and has been Member for Surrey, Guilford Division, since the latter year. In 1895-98 he was Under Secretary of State for War and in October 1898 was appointed Under Secretary for Foreign Affairs, to succeed Mr. George N. Curzon, now Lord Curzon of Kedleston, the new Viceroy of India. In his official career thus far, Mr. Broderick has shown great industry, honesty and administrative power. His new position is the most responsible one outside of the cabinet.

BROOKE, JOHN R., Major-General, U. S. A. He was born at Pottsville, Pennsylvania, July 21, 1838. On November 7, 1861 he became a captain in the Fourth Pennsylvania Infantry; rose to the rank of colonel and of brevet brigadier-general for gallantry at the Wilderness and Spottsylvania; resigned from the service in February 1866: In July of that year he was appointed lieutenant-colonel of the Thirty-seventh United States Infantry, and was promoted to the colonelcy in March 1879. On April 6, 1888 he was made brigadier-general, and major-general on May 22, 1897. Upon the evacuation of Porto Rico, he was made military commander of that island, and was succeeded on December 5, 1898, by Brigadier-General Guy V. Henry. On the thirteenth of the month General Brooke was appointed civil and military governor of Cuba. See SPANISH-AMERICAN WAR (paragraph Campaign in Porto Rico).

BROOKLYN INSTITUTE OF ARTS AND SCIENCES originated in 1824 in the Brooklyn Apprentices' Library Association, which name was changed in 1843. The Brooklyn Institute was organized in 1887 and made rapid progress. The first section of the Museum Building was completed and opened in 1897. The building and its equipment cost \$335,500. During the first year, ending June 1, 1898, the attendance was 126,046. A second building in Bedford Park is used as an auxiliary to the main Museum. Admission to the museum is free, except on Mondays and Tuesdays. The hours are 9 A.M. to 6 P.M., every week-day; Thursday and Friday evenings 7:30 to 9:45, and Sundays, 2 to 6 P. M. A. A. Healy, President; Rev. R. S. Storrs, Chas. A. Schieren and Carroll H. De Silver, Vice-Presidents; G. C. Brackett, Secretary; William B. Davenport, Treasurer; membership, 5,832.

The institute has departments of instruction in which lectures are given on anthropology, archæology, architecture astronomy, botany, chemistry, domestic science, electricity, engineering, entomology, fine arts, geography, geology, law, mathematics, microscopy, mineralogy, music, painting, pedagogy, philately, philology, photography, physics, political science, psychology, sculpture and zoology. The library comprises 26,000 volumes. Connected with the institute, is the biological laboratory at Cold Spring, L. I., and the Westhampton summer school of art. In 1898 the Brooklyn Institute was granted \$20,000 by the city of New York. Annual income \$99,058. Permanent funds, \$232,153. In 1898 the membership was 5,417, and an attendance of 334,670 persons upon the various lectures.

BROTHERHOOD OF ANDREW AND PHILIP was founded in Reading, Pa., in 1888, the sole object being "the spread of Christ's kingdom among young men" by prayer and service, and had its first federal convention in New York city in 1893. It is composed of nineteen evangelical denominations: The Reformed Church in America, the Reformed Church in the United States, the Lutheran, the Church of Christ, the Progressive Brethren, Friends, United Evangelical, Baptists, Methodists, Presbyterians, etc., etc. There were at the close of 1898, 461 chapters with a membership of 14,000. *The Brotherhood Star*, the organ of the society, is published monthly in New York City. The president of the federal council is the Rev. R. W. Miller, also its founder; secretary and treasurer, Rev. C. E. Wyckoff, Irvington, N. Y. Its last meeting in 1898 was held in Baltimore, Md.

BROTHERHOOD OF ST. ANDREW, a Protestant Episcopal organization which originated in St. James's Church, Chicago, Ill., and began its work on St. Andrew's Day, 1883. It was started as a parochial organization solely, but was imitated in

various parishes in Chicago and other cities of the United States, until in three years thirty-five of these Brotherhoods of St. Andrew existed. In 1886 it was decided to organize. There are reported 1,220 chapters with a membership of about 13,000 men. *St. Andrew's Cross*, published in New York City, is the organ. Officers for 1899: President, James L. Houghtaling, Chicago, Ill.; Secretary, John W. Wood, New York; and Treasurer, John P. Faure. Brotherhoods of St. Andrew have also been organized in Canada, with 180 chapters and 2,000 men; and in Australia, with 40 chapters. Besides these, chapters have been formed in connection with the Scottish Episcopal Church and the Church of England.

The object is to "spread Christ's kingdom among men," and its rules are the rule of prayer, to pray daily; and the rule of service, to bring one man each week to church.

BROTHERHOOD OF THE KINGDOM, a religious society, founded in 1892, now consists of 100 members. Its object is "to apply the principles of the gospel to the thought and life of to-day, and thus to re-establish the idea of the kingdom of God in the thought of Christians, and to assist in its practical realization in the world." Leighton Williams, Secretary, 312 W. 54th street New York.

BROTHERS OF NAZARETH, ORDER OF, a charitable and religious order, incorporated in 1890, for industrial, educational, and preventive work among boys, and for the care of the poor and suffering. It maintains: All Saints' Pavilion for Convalescent Men and Boys, St. Paul's Training School for Boys, and St. Andrew's Cottage, Farmingdale, L. I., "a fresh air home" for poor boys. Brother Gilbert is the superior. Headquarters, Mother House, Priory Farm, Verbank, Dutchess Co., N. Y. Rt. Rev. H. C. Potter, visitor; Rev. John W. Brown, D. D., New York, President; Richard Stevens, Hoboken, N. J. treasurer; and Donald McLean, New York, secretary.

BROWN, Rev. THOMAS MCKEE, rector of the Protestant Episcopal Church of St. Mary the Virgin, New York City, died December 19, 1898. He was born in Philadelphia, Pennsylvania, in 1841; was graduated at Trinity College, Hartford, in 1864, and at the General Theological Seminary, New York, the following year. After the death of Rev. James De Koven, D. D., he was recognized as the leader of the ritualistic movement. He was the founder of the New York Catholic Club, and, with Bishop Grafton, of Fond-du-Lac, Wisconsin, of the American branch of the Confraternity of the Blessed Sacrament, and was one of the founders of the Guild of All Souls, the object of which is intercession for the repose of the souls of the dead.

BROWN UNIVERSITY, at Providence, Rhode Island, was founded in 1764. It is non-sectarian, but is closely affiliated with the Baptist denomination, and is co-educational, the Women's College being not a corporation by itself, but a department of the university. Besides the usual academic and scientific departments, there are courses leading to the degrees of C. E. and M. E. No other professional degrees, however, are conferred. In 1898 the library contained about 100,000 volumes; the officers of instruction for the year 1898-99 numbered 79; and there were 925 students, including 99 graduate students and 165 in the Women's College. The degrees conferred in 1898 besides four honorary degrees were as follows: B. A., 70; Ph. B., 50; M. E., 6; M. A., 24; Ph. D., 2. The university conducts a system of university extension. In 1898 President E. Benjamin Andrews, LL. D., resigned to become superintendent of schools in Chicago, and Professor Benjamin Franklin Clark, Sc. D., was president *ad interim*.

BRUCE, BLANCHE K., Register of the Treasury of the United States, was born a slave in Prince Edward county, Virginia, March 1, 1841, and died in Washington, D. C., March 17, 1898. Having served in various positions of political trust, including the Federal Senatorship from Mississippi, he was appointed to the office of Register of the United States Treasury under President Garfield in 1881-5, was re-appointed by President McKinley, December 2, 1897, and was holding the office at the time of his death. On March 24, 1898, the President nominated as his successor Mr. Judson Lyons of Georgia. Mr. Bruce was one of the foremost Republicans in the south, and was the first colored man elected to the United States Senate.

BRUNEL. See BORNEO.

BRUNETIERE, FERDINAND. See FRENCH LITERATURE (paragraph Criticism).

BRUNSWICK, DUCHY OF, is a State of northern Germany with a population on December 2, 1895, of 434,213, of whom the great majority belonged to the Lutheran Church, the Roman Catholics numbering only 16,419 at the census of 1890. The chief crops are oats, wheat, rye and beet-root. Mineral products, including salt, are obtained in considerable quantities. In the beginning of 1897 the public debt amounted to 27,408,738 marks (the mark in United States gold being between 23 cents and 24 cents). The budget estimate for 1897-98 was 13,750,000 marks. The constitution dates from 1832 but was modified in important particulars by the fundamental laws of 1851 and 1888. The legislative body consists of one chamber composed of repre-

sentatives and meeting every two years. Executive authority is vested in the duke, who is aided in the government by responsible ministry of state consisting of the departments of (1) State Foreign Affairs and Finance, (2) Justice and Ecclesiastical Affairs, and (3) the Interior. In 1898 the ruler was Prince Albrecht, who was chosen regent in 1885.

BRUSSELS, the capital of Belgium, is situated on a tributary of the Dyle. It has canal connection with Antwerp and the Baltic sea and railway connection with the principal towns of Europe. Its population on January 1, 1896, was estimated at 531,011 including the suburbs. It is the seat of an important university, which during the academical year 1895-96 was attended by 1,265 students. In 1895 preparations were made for widening and deepening the canal which connects the city with the Scheldt river and for constructing a commodious harbor. According to the plans discussed in 1897 it will pass through the plain of Thurn and Taxis and new docks will be built in the very heart of the city. See BELGIUM.

BUBONIC PLAGUE. See INDIA, paragraph Plague; PUBLIC HEALTH.

BUCKWHEAT. The following table published by the Department of Agriculture shows the acreage, production and value of buckwheat in the United States in 1898:

States and Territories.	Acres.	Production Bushels.	Value.
Maine	23,994	635,841	\$247,978
New Hampshire	2,976	59,520	27,974
Vermont	10,161	217,445	100,025
Massachusetts	2,254	45,080	27,499
Rhode Island .....	.....	.....	.....
Connecticut	3,461	65,759	36,825
New York	242,149	4,068,103	1,830,646
New Jersey	10,635	223,335	120,601
Pennsylvania	237,529	4,085,499	1,797,620
Delaware	321	5,296	2,118
Maryland	7,586	92,549	49,051
Virginia	4,759	82,331	37,049
North Carolina	1,590	31,005	14,882
South Carolina .....	.....	.....	.....
Georgia .....	.....	.....	.....
Florida .....	.....	.....	.....
Alabama .....	.....	.....	.....
Mississippi .....	.....	.....	.....
Louisiana .....	.....	.....	.....
Texas .....	.....	.....	.....
Arkansas .....	.....	.....	.....
Tennessee	1,197	21,546	11,204
West Virginia	14,599	299,280	146,647
Kentucky .....	.....	.....	.....
Ohio	9,911	198,220	101,092
Michigan	25,366	360,197	151,283
Indiana	5,126	94,318	48,102
Illinois	5,013	70,182	36,495
Wisconsin	35,155	544,902	217,961
Minnesota	13,087	196,305	96,189
Iowa	13,295	212,720	102,106
Missouri	2,550	40,290	24,174
Kansas .....	.....	.....	.....
Nebraska	5,373	68,774	41,952
South Dakota .....	.....	.....	.....
North Dakota .....	.....	.....	.....
Montana .....	.....	.....	.....
Wyoming .....	.....	.....	.....
Colorado .....	.....	.....	.....
New Mexico .....	.....	.....	.....
Arizona .....	.....	.....	.....
Utah .....	.....	.....	.....
Nevada .....	.....	.....	.....
Idaho .....	.....	.....	.....
Washington .....	.....	.....	.....
Oregon	245	3,430	1,989
California .....	.....	.....	.....

States and Territories.	Acres.	Production Bushels.	Value.
Oklahoma .....	.....	.....	.....
Indian Territory .....	.....	.....	.....
Total	678,332	11,721,927	\$5,271,462

BUDDHISM. See RELIGIONS.

BUELL, General DON CARLOS, a well-known veteran of the Civil War, died at his home near Rockport, Kentucky, November 19, 1898. He was born on the site of Lowell, Ohio, March 23, 1818. Upon his graduation at the West Point Military Academy in 1841, he was assigned to the Third Infantry; served in the Florida and Mexican wars, being wounded at Cherubusco, and was brevetted captain and major. From 1848 to the breaking out of the Civil War he was an assistant adjutant general, but in 1861 he became a lieutenant-colonel, and on May 11 of that year was appointed brigadier-general. He assumed command of a division of the Army of the Potomac in August, and the following November succeeded General W. T. Sherman as commander of the department of the Ohio. In 1862 Buell was made major-general of volunteers and his troops in his campaign in Kentucky and Tennessee were known as the Army of the Cumberland. This campaign was begun early in the year, and the long marches of the men under Buell have been recognized as a remarkable military feat. He occupied Bowling Green, on February 14, 1862, Gallatin, Tenn., on February 23, and Nashville two days later. The next month he took part in the battle of Shiloh. In the following July the Confederate General, Bragg, began so vigorous a campaign against Buell that the latter fell back; charges were preferred against him and a military investigation was ordered by the Washington government. Buell's army was compelled by Bragg to abandon Lexington and Frankfort and finally to evacuate central Tennessee and retire to Louisville. Upon this General Thomas was ordered to succeed (September 30) to Buell's command, but the latter was restored on the same day, and thereupon began an advance against Bragg, whose forces he met in the battle at Perryville, October, 8. The Confederates withdrew and the apparent remissness of the Union general in not taking advantage of the situation led to his being superseded by General Rosecrans and to the appointment of a commission for the investigation of his conduct. His trial, which was begun November 24, 1862, was not ended until May 10, 1864, and the commission's report has never been made public. On June 1, 1864, General Buell resigned from the army. According to an act of Congress in 1895 he was appointed a major-general and retired as such at full pay. At one time he was interested in coal mining, but his enterprise was finally unsuccessful. He was also president of an iron works corporation. President Cleveland appointed him pension commissioner. Despite some patent military shortcomings, General Buell had many of the qualities of a great soldier. He did much toward keeping Kentucky true to the Union, he rendered most valuable aid to Grant at Shiloh, he did most excellent work in training the Army of the Cumberland. He was firm and self-controlled and had "a certain stately dignity and reticence," while his courtesy has been called that of "a gentleman of the old school."

BUILDING STONES. The value of building stones produced in the United States in 1897 was:

Granite	\$8,905,075
Marble.	3,870,584
Slate	3,524,614
Sandstone	4,065,445
Limestone	14,804,943
Bluestone (est'd).....	900,000

The 1897 report of mineral resources issued by the U. S. Geol. Survey contains much information concerning the building stones of the United States, as well as a detailed account of the Bedford, Ind., limestone so much used for building at the present day.

Vol. II, Md. Geol. Surv. in addition to a special report on the building stones of that State, contains a valuable report on the physical, chemical and economic properties of building stones.

BULGARIA was created by the treaty of Berlin in 1878 an autonomous principality tributary to the Sultan of Turkey. Its area, including Eastern Roumelia which was united with Bulgaria in 1885 and is now sometimes called Southern Bulgaria, is 37,560 square miles and its population on January 1, 1893, was 3,309,816, of whom 2,504,336 were Bulgarians, 569,728 Turks, and the remainder in the order of their numerical importance Greeks, Gypsies, Jews, Germans and Russians. Its capital is

Sofia with a population in 1893 of 47,000. The majority of the people are engaged in agriculture, the soil in some parts being very fertile. The chief crop is wheat which is largely exported. There is also an important trade in other grains and in live stock and in animal products. The state owns the minerals and works the coal mines. There are manufactures of woolens, cottons, cord, cigars and cigarettes. Bulgaria carries on a considerable trade with the other European countries; with the United States its trade is small. In 1897 there were signs of an increased interest in railway building and plans for several new routes were proposed. Foreign goods entering Bulgaria are liable to customs duties and to certain octroi taxes. Bulgaria has treaties of commerce with several foreign nations and in 1898 the government applied to other countries the rates of import duty established by the commercial conventions with Great Britain, Austria-Hungary, Italy, France and Servia. The constitution dates from 1879 and was amended in May 1893. It vests the legislative authority in a single chamber called the Sobranje, whose members are elected by universal manhood suffrage in the proportion of one to 20,000 of the population. There is also a Great Sobranje consisting of representatives elected on the basis of one to 10,000 of the inhabitants and having authority to decide upon proposed changes in the constitution, and matters of supreme national importance. The constitution vests the executive authority in the Prince and in a council of eight members nominated by him, these members being the executive heads of the ministries of foreign affairs and public worship, the interior, public instruction, finance, justice, war, commerce and agriculture, and public works. The reigning Prince is Ferdinand of Saxe-Coburg, who was elected by the national assembly in 1887, the election being confirmed by the Porte and the great Powers in 1896. The state religion is the orthodox Greek faith to which the majority of the people belong. Attention was drawn to Bulgaria in 1897 on account of its supposed design to interfere in the Græco-Turkish difficulty, but it was soon seen that the government had no intention of giving aid to the Greeks. In August, 1897, Prince Ferdinand visited the Sultan and it was supposed that a closer and more friendly relation would follow between the principality and the Porte.

Political and Economic Progress.—In August 1897, Bulgaria celebrated the tenth anniversary of the accession of Prince Ferdinand. A French writer in 1898 gives a brief review of the progress of Bulgaria during this period of ten years which may be of interest here as serving to explain the present conditions of the country. It will be remembered that a year passed before a successor to Prince Alexander of Battenberg was found, and that Ferdinand of Saxe-Coburg though chosen by the national assembly of Bulgaria, was not acceptable to Russia. Nevertheless, he ascended the throne in 1887 and applied himself to the difficult task of governing a people divided by party passions and thrown into confusion by a long period of political conflicts and foreign war. His position was embarrassing, for not only was the government of Russia opposed to him, but he could not count upon the confirmation of his election on the part of the other powers of Europe, and if he were not recognized by the latter it was questionable whether the Porte would admit his rights as Governor-General of Eastern Roumelia. These were some of the difficulties with which he had to deal in the domain of foreign affairs, and the domestic situation was equally grave. In the first place there was a party which cherished the friendship of Russia and was naturally hostile to the Prince whose election had been opposed by that power. Moreover, during the period of interregnum the high-handed policy of M. Stambouloff had greatly angered a large portion of the people and yet it was difficult for the new prince to break off with Stambouloff at once, since the latter represented what stable authority there was in the principality. During the first part of the reign Prince Ferdinand applied himself to a study of the country and of the political parties. This preparatory period may be said to have lasted until 1894, when the time came for definite action. The policy which the Prince decided upon was separation from Stambouloff and his party and reliance upon the more moderate party. By this time it appeared that the majority of the people had ranged themselves on the side of the Prince and he thought he was strong enough to overthrow the unpopular Minister. The fall of Stambouloff followed and the control of affairs was entrusted to the moderate party. The way was now open to a reconciliation with Russia, especially after the death of Alexander III, for the new Emperor had not been at all concerned in those events in the past which divided political opinions in Bulgaria. Thus one important question,—the relations of the Prince to Russia,—was answered in a manner favorable to the wishes of the latter state. Another question was that involving the status of Eastern Roumelia. When the Sultan recognized Prince Ferdinand as Prince of Bulgaria, he merely conceded his right as Governor-General of Eastern Roumelia, the latter country remaining nominally a dependency of the Porte. Nevertheless the union of Eastern Roumelia with Bulgaria was accepted by the great powers, and the slight tie between the former and the Porte was in effect broken, although the fiction of immediate dependence upon Turkey was maintained.

The third important matter was the Macedonian question. Macedonia, it will be remembered was included in the limits of Bulgaria by the treaty of San Stefano, and the Macedonians, of whom a large part are Bulgarians, have joined with the latter in their demands for religious autonomy. It was important to the Bulgarians of Macedonia that the bishops, who were the official representatives of their religion in Turkey, should be members of their own race. The Bulgarian government took the Macedonian side of this question, and in 1890 and 1894 induced the Porte to issue letters patent to Bulgarian bishops in the Macedonian dioceses.

These are some of the successful results of the reign: in fact, during the ten years from 1887 to 1897 what no one would have predicted actually came to pass. The Prince not only was accepted unanimously by the Bulgarian nation, but he was recognized by all the powers and treated as an independent sovereign. His own state, moreover, attained a far higher degree of civil harmony than it had before possessed and seemed at the end of the period to be on the high road to prosperity.

Among the signs of progress noted by the writer above mentioned was the improvement of the finances, which appears to have taken place in spite of occasional deficits. The government strictly fulfilled its financial obligations and the debt was not increased in spite of the fact that the construction of the railways exceeded the means afforded by the ordinary resources. In 1897 the railway mileage in Bulgaria was nearly doubled, and the state possessed nearly two-thirds of the entire mileage, and three times as much as it possessed in 1887. The government has also tried to promote maritime development. The postal and telegraph service greatly improved during the period, and telephone lines were constructed between Sofia and Philippopolis, and between Sofia and Rustchuk. The development of Bulgarian commerce and industries also received especial care, and in 1893 a new ministry known as the ministry of commerce and agriculture, was established. Since then a great number of laws have been passed for the encouragement of commercial and industrial enterprises, including the establishment of chambers of commerce and industries, the exemption of imposts for certain enterprises, and the advancement of industrial and agricultural education. It was reported in 1897 that the number of factories had more than doubled in the principality within the decade. Although private capital is still scanty, credit hard to obtain, and interest high, private enterprise has on the whole increased. Many new companies have been formed, including insurance companies, banks, and saving institutions. One sign of progress has been the great increase of the population of the capital, Sofia, which numbered 20,000 in 1881, and 45,000 in 1893. There has also been a considerable increase in the other important cities, especially Varna and Rustchuk.

Events of 1898.—On January 4, 1898, letters patent for the Bulgarian bishoprics at Monastir, Divra and Strummitza were granted by the Sultan. Prince Ferdinand's visits to the Czar in 1897 and 1898 were taken as a further sign of the growing friendship between the two governments, and his offer in 1898 to reinstate the twenty-one officers who had taken part in the conspiracy against his predecessor, Prince Alexander, strengthened this impression. Trouble on the Macedonian frontier disturbed Bulgaria in the spring of 1898, and the government complained to the Porte of the barbarities committed by Turkish troops in the attempts to disarm the people who had shown sympathy with the movement for Macedonian independence. On August 11th there was a meeting at Sofia of a congress of the Macedonians in Bulgaria. On the basis of the project of reform drawn up by the Central Macedonian Committee, the following changes were demanded: (1) The formation of a single province of Macedonia comprising the three vilayets of Monastir, Uskub and Salonica; (2) the appointment of a governor-general belonging to the race and religion predominant in the province; (3) the election of a provisional assembly with the power of voting the budget; (4) the creation of a provincial militia.

BUREAU OF AMERICAN ETHNOLOGY. See ANTHROPOLOGY.

BURGESS, A. M., Commissioner of Dominion lands, died at Ottawa, Ontario, February 25, 1898. He was born in Inverness-shire, Scotland, October 21, 1850. For some years he was a journalist, being connected with the *Toronto Globe* and subsequently with the *Ottawa Times*. He was made secretary of the interior department in 1882 and in 1883 its deputy head.

BURMAH, is a part of the Indian Empire stretching from the confines of Thibet on the north to China on the east and Siam on the southeast. On the south and west it is bounded by the Indian provinces of Bengal and Assam and by the ocean. It has an area variously estimated at from 171,430 square miles to 280,000 square miles, the lower estimate being the more recent, and a population in 1891 of 7,605,560. It consists of the old province of Lower Burmah and the province of Upper Burmah, which was annexed by proclamation in 1886. It is governed as a part of the Indian Empire by a lieutenant-governor appointed by the Viceroy. It has a fertile soil and abounds in mineral deposits including cop-

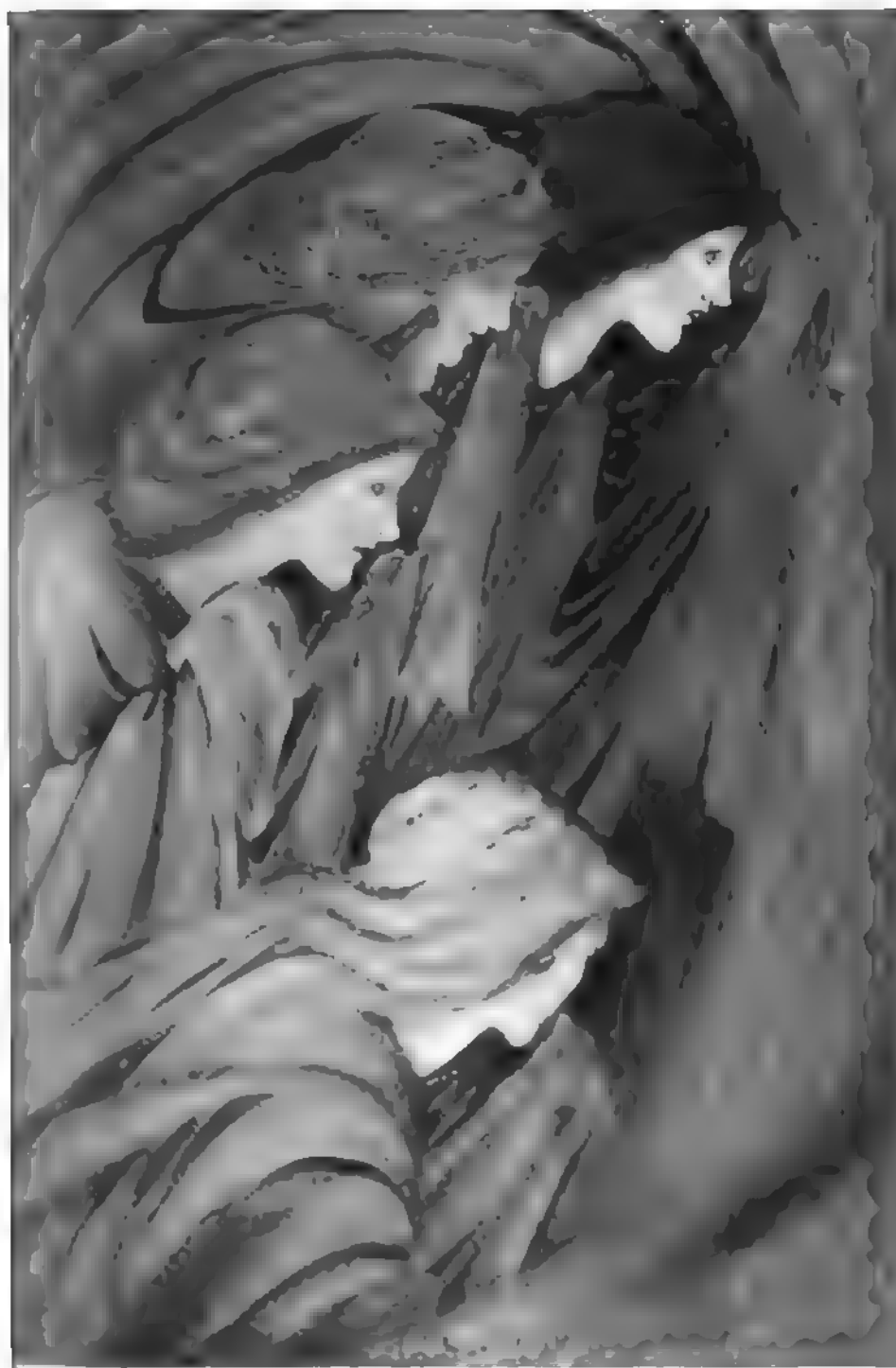
per, lead, iron, tin, jade, amber, ruby, marble, coal and small quantities of gold. The majority of the inhabitants are Buddhists. It is separated from Indo-China by the Shan States, the boundary between the territories of Great Britain and France being fixed by agreement in January 1896, along the Mekong river. The development of the railway system has been rapid in recent years. In 1896 Messrs. Rothschild & Sons announced the formation of the Burmah Railways Company with a capital of £2,000,000. This syndicate acquired several lines already open to traffic and set to work to build new ones. In 1897 the work on the Mandalay-Kunlou railway was carried on and it was announced that it would be complete in 1899. At the beginning of 1898 it was reported that 1,148 miles of railway were officially sanctioned, 887 miles being open for traffic. In 1897 the status of the country was raised to the rank of a local government under a lieutenant-governor, aided by a legislative council of nine members. For the year ending March 31, 1896, the revenue was Rx 5,922,279 and the expenditure Rx 4,217,712.

BURNE-JONES, SIR EDWARD COLEY, A. R. A., English artist, died suddenly in London, June 17, 1898. He was born at Birmingham, August 28, 1833; received his elementary education at King Edward's grammar school, from which he entered Exeter College, Oxford, in 1853, but did not take a degree until 1881, when he received an honorary D. C. L. from Oxford and an honorary fellowship in Exeter College. He began his art career in London in 1856; instead of going to an academy he taught himself, and soon came under the influence of Dante Gabriel Rossetti, from whom he received much help and with whom he came to constitute a part of the romantic (pre-Raphaelite) school. He received an election to the Royal Academy of Arts in 1885, and in 1887 he assisted in establishing the New Gallery of Art. In 1895 he was made a baronet. Besides his prominence in oil work, Burne-Jones was accounted a master in stained glass designs and in mosaic. The draughtmanship in some of his early paintings is not perfect, but they show a wonderful mastery in vivid coloring; in his later works the drawing is very superior, while the coloring is more subdued, greys and light purples being predominant. In almost all of his pictures there is an atmosphere of poetry, a suggestion of the unreal, of fairyland, and yet from another point of view they express true realism. His line of imagination lay along "the beautiful and mysterious borderland" of the worlds of actuality and of dreams. Burne-Jones, moreover, was both an idealist and a conscientious, persistent, painstaking worker. He had high ideals of work and duty. "Our work," he said, "must be the best of its kind, the noblest we can offer." And most of his, indeed, was noble and the best of its kind. At the time of his death it was said of him that he "has bequeathed to us in the last quarter of a century a greater heritage of beauty than any other English painter has done." Burne-Jones was not only a great craftsman, a master of technique, but he was a man of high and serious aspirations, a man of real spirituality. His large conception of an artist's work may be felt in the following words, which are his: "To be a great painter a man must also have a great spirit. He must be a dreamer, and not ashamed of his dreams; must, indeed, account them of paramount worth; he must be prepared for both indifference and hostility; he must be so continent of his faith that he will not barter the least portion of it in order to win a worthless approval; he must be so proud that he will disdain to prostitute his genius to a public use; he must be so single hearted that, like Sir Galahad, there can be for him only one Sanc Grael—beauty, and only one quest—the lifelong, insistent effort to discern and interpret in beauty, that Loveliness, that Beauty, which is at once his inspiration, his dream, his despair, and his eternal hope."

Among his principal works are: "Annunciation and Nativity," in St. Paul's, Brighton (1861); "The Merciful Knight" (water color, 1864); "The Wine of Circe" (water-color, 1867); "The Days of Creation"; "The Wheel of Fortune"; "Pygmalion and the Image"; "Aurora"; "The Mirror of Venus"; "Love among the Ruins" (water color, 1873); "Laus Veneris" (1873-5); "The Beguiling of Merlin" (1877); "Le Chant d'Amour" (1878); "The Golden Stairs" (1880); "King Cophetua" (1884); "The Depths of the Sea" (1886); "The Brazen Tower" (1888); "The Legend of the Briar Rose" (1890).

BURNS, Rev. WILLIAM, D. D., born in Kingston, Ontario, 1840; died at Galt, Ontario, January 2, 1898. He was secretary of the aged and infirm ministers' fund of the Presbyterian Church in Canada, and for some time was secretary of Knox College, Toronto.

BUTLER, CHARLES, LL. D., president of the council of New York University, died December 13, 1897. Born February 15, 1802, at Kinderhook Landing (now Stuyvesant), Columbia county, New York, he was educated at the Greenville (New York) academy, and, without receiving collegiate training, entered the law office of Martin Van Buren, and in 1824 was admitted to the bar. In 1835, the year before Van Buren's election to the presidency, Mr. Butler took up the practice of law in New York City, and in 1836 became a member of the council of New York University.



THE UNINTERPRETED DREAM.

Completed picture by Sir Edward Burne-Jones. By kind permission of the Blakeslee Galleries, New York.

He was interested in the Michigan Southern, Chicago and Northwestern, and Chicago and Rock Island railroads. Until the time of his death he was a patron of New York University. His honesty of purpose, generosity, and foresight did much to bring success to the university, and he lived to see many of his far-reaching plans realized or in process of realization. Mr. Butler did much toward organizing various philanthropic movements in and about the city. He was one of the founders of the Protestant Half Orphan Asylum and of Union Theological Seminary; to the latter institution he gave \$100,000 to found the Edward Robinson chair of Biblical theology. He gave a like amount to New York University.

BUTLER, Major-General MATTHEW CALBRAITH, was appointed by President McKinley, August 16, 1898, a member of the commission to arrange for the evacuation of Cuba by the Spaniards. He was born about sixty years ago; was a captain of Confederate cavalry in the Civil War and attained the rank of major-general. He lost a leg at Brandy Station. In 1870 he was the Union Reform candidate for governor of South Carolina. He returned to the Democratic party and by it was elected to the United States Senate for the term beginning in 1877; he was returned for the next two terms, his last term expiring in 1895.

BUTTERWORTH, BENJAMIN, United States Commissioner of Patents, was born in Warren county, Ohio, October 22, 1822, and died in Thomasville, Georgia, January 16, 1898. From the Civil War to the time of his death he was well known in politics and public affairs and was a man of great popularity. He was educated at Ohio University, Athens, and after studying law in Cincinnati was admitted to the bar in 1861. He had a creditable record for service in the Civil War. In 1870 he became United States district-attorney, and was elected to the United States Senate for 1873-74. For five terms he served as a Republican Congressman from his native State, his first two terms beginning in 1878 and the last three in 1884. In 1883 President Arthur appointed him to the office of Commissioner of Patents, to which position he was reappointed by President McKinley in the spring of 1897. He will be remembered as the author of the compulsory army retirement act.

BYRNES, THOMAS JOSEPH, Premier and formerly Attorney-General of Queensland, died September 27, 1898. He was born at Brisbane in 1860; was educated at Brisbane Grammar School, and Sydney and Melbourne Universities, becoming a barrister in Victoria in 1884. In the following year, however, he began practicing in Queensland, and in 1890 entered the legislative council as solicitor-general.

CAIRD, JOHN D. D., LL. D., Principal and Vice-Chancellor of Glasgow University and prominent Scottish minister in the established church, died July 30, 1898. He was born at Greenock, Scotland, in December 1820; was educated at Greenock Grammar school and at the University of Glasgow, at which he was graduated in 1845; the same year he was ordained minister of Newton-on-Ayr. In 1847 he became minister of Lady Yester's Parish, Edinburgh, and two years later went to the parish of Errol, Perthshire. Here he remained until called to the Park church, Glasgow, in 1857. He was appointed professor of divinity in his *alma mater* in 1862 and in 1873 became Principal and Vice-Chancellor. For some time he was one of Her Majesty's chaplains for Scotland. He was not prominent in strictly ecclesiastical matters. Among his publications are the following: *Sermons* (1858); *Unity of the Sciences* (1873-74); *Introduction to the Philosophy of Religion* (1880); *The Religions of India*; *Brahmanism and Buddhism* (1881); *Spinoza* in Blackwood's *Philosophical Classics* (1888).

Dr. Caird was accounted one of the very foremost preachers in Great Britain; his sermon entitled *The Religion of Common Life* achieved world-wide fame and, though published in 1855, has by no means drifted out of the public mind. As a preacher he was intense, magnetic, and powerful; he was a profound theologian and clear thinker, and yet, for depth and originality, he can not be classed with the first rank of theologians and speculative thinkers. Dr. Caird belonged to the progressive school of Scotch Presbyterians, and as far back as 1862, when he was called to the divinity professorship he was suspected by some of unorthodox tendencies. The task which he took upon himself, and which he accomplished, was the successful exposition of a philosophical Christianity; it was a difficult task, indeed, to make clear to the sternly "orthodox" Scottish mind a religion interpreted in terms of German philosophy, especially that of Hegel. Although German philosophy has very little in common with the rigid Calvinism of Scotland, John Caird preached with such enthusiasm and at the same time with such tact and cleverness that his hearers seldom realized that they were being taught a neo-Hegelianism. As an instructor and as principal of Glasgow, his influence was very great, though in this country he was known hardly as well as his brother, Edward Caird, LL. D., master of Balliol, Oxford, and author of *The Critical Philosophy of Immanuel Kant*. Upon the death of Dr. John Caird, the *London Spectator* said "On the one side stood the Scottish kirk with its great and rigid doctrinal system, on the other . . . literary

and human tendencies . . . rich in their appeal to the young and generous mind. It would seem to have been the primary task of John Caird to reconcile the two possibly conflicting tendencies by a philosophic interpretation of Christianity, shed of impossible dogmas and allied to reason and to the progressive forces of society. For a generation John and Edward Caird had under their hands the intellectual and theological training of the youth who were to pass into the pulpits of the Established, Free, and United Presbyterian churches of Scotland, and they imbued the minds of these nascent Scottish pastors with reasonable and philosophic Christianity which has powerfully affected Scotland, and, through Scotland, the whole English speaking world." The orthodoxy of Scotland to-day is "of a new type, consistent with freedom of criticism and with brighter hopes as to the destiny of man than those furnished by Knox and Calvin."

CAIRO, the largest city of Egypt, had according to the census of June 1897, a population of 570,062. For an account of the scheme for a railway to connect Cairo with the Cape. See the articles "CAPE TO CAIRO" RAILWAY SCHEME and AFRICA.

CALCUTTA, the capital of the province of Bengal and the metropolis of India, lies on the west bank of the river Hoogly, a branch of the Ganges about 100 miles from the sea by the river. In 1891 it had with its suburbs, exclusive of Howrah, a population of 861,764. It is the seat of an important university, which in 1896 was attended by 2,308 students. It is a great center of trade. The foreign commerce is naturally for the most part with Great Britain and her colonies. It is the great distributing point for Bengal. The cotton and jute trade is especially important. The report of the American Consul in 1898 stated that about 99 per cent. of the trade in cotton piece goods and yarn was controlled by the United Kingdom. At the same time the recent establishment of a direct line of steamships from Calcutta to New York promises to promote the trade with the United States. Some American brands of cotton goods have already been introduced and the trade shows signs of improvement. The jute industry suffered temporarily from the official announcement that the plague existed in Calcutta, and about 250,000 people are said to have left the city, thus causing a scarcity of labor, but the deaths from the plague were comparatively few and the people soon recovered from their panic. In the year 1896-7 the imports from the United States increased in value on account of the large quantities of grain shipped to India to meet the necessities arising from drought and famine. This especial stimulus to imports being removed, the total value of the imports from the United States fell off in 1897-98 but the general condition of trade between the two countries was much improved. The exports to the United States were higher than they had been for a number of years. Among the important articles imported from the United States to Calcutta may be mentioned kerosene and lubricating oils, the imports of which have greatly increased during recent years. Another item of importance is American steel rails. The chief item of the exports from Calcutta to the United States is jute and the exportation of jute manufactures has steadily advanced until in 1897-98 the figures reached the highest point on record. The next item of importance is hides and after this come raw jute, indigo, lac, saltpetre, tea, etc. The trade of Calcutta with Germany has also increased and the same is true of its trade with Austria-Hungary, Italy and Belgium, but with Russia and France the trade seems to have declined. See INDIA.

CALDERON, PHILIP HERMOGENES, R. A., Knight of the Legion of Honor, a prominent artist, died in London, England, May 1, 1898. He was born of Spanish parentage at Poitiers, France, in 1833, was educated at Leigh's School of Art, London, and the atelier of M. Picot, Paris. He was made an Associate of the Royal Academy in 1864 and an Academician three years later. From 1887 to the time of his death he was Keeper of the Royal Academy. His first exhibit at the Royal Academy was "By the Waters of Babylon," 1853. After that time he exhibited: "Broken Vows," "The Gaoler's Daughter," "Lost and Found," "The Young Heir's Birthday," "La Demande en Mariage," "After the Battle," "The British Embassy in Paris on St. Bartholomew's Day," "The Burial of John Hampden," "Her Most High and Puissant Grace," "Home After Victory," "The Orphans," "On Her Way to the Throne," "Home They Brought Her Warrior Dead," "Refurnishing," "Les Coquettes," "Arles," "On the Banks of the Clain near Poitiers," "The Olive," "The Vine," "The Flowers of the Earth," "Night," "Morning," "Summer," "Aphrodite," "Andromeda," "St. Elizabeth of Hungary," "Elizabeth Woodville Parting from her Son, the Duke of York," "Ariadne," "Spring-time;" many portraits, water colors, etc.

CALIFORNIA, an extreme western State of the United States with a land area of 155,980 sq. m. Capital, Sacramento.

Mineralogy, etc.—During 1898 operations in the petroleum region of Southern California, especially in Los Angeles county, reached the extent and excitement of a positive boom. A large amount of capital and many experienced operators from New York, Ohio, and Pennsylvania were attracted to the newly discovered fields.

The richest veins were found in the suburbs of the city of Los Angeles, particularly to the north. In 1895 there were 22 oil wells in operation in all of Southern California; in October, 1898, there were over 700, of which 443 were in the outskirts of Los Angeles City. Nearly \$1,000,000 of capital was invested in the industry there, and at that time the production was about 7,500 barrels per day. An interesting feature of the oil excitement was the fact that the Southern Pacific and the Atchison, Topeka, and Santa Fé railroad companies changed the locomotives on their Pacific divisions from coal to crude oil burners because of the greater cheapness of the oil. In February, Wells, Fargo & Co. estimated the yield of gold mines in the State during 1897 at \$18,817,876, and of silver mines at \$12,948, making the aggregate nearly \$1,000,000 more than the mint estimate. Nevada county still led in the production, with an output of about \$2,500,000, making its total since the discovery of gold \$212,000,000. A number of new finds were made during the year, especially in Shasta, Calaveras, San Bernardino, Trinity, Los Angeles, and Kern counties. In the last-named county, the discoveries of gold in 1897 led to the organization of several new mining towns, of which Randsburg and Johannesburg became the most notable during 1898. Unusual attention was given to river bed mining, which has had a more important development in California than in any other part of the world. In Shasta county there was a marked revival in copper mining. The copper belt was found to begin at Iron Mountain and to follow a northeast course in a semicircle for 25 miles. Several large companies, including New York, Berlin, and Düsseldorf syndicates, were exploiting this belt from end to end. The scarcity of sulphur for powder-making in the early part of the war with Spain led to explorations which seemed to show that under proper development the Pacific coast would yield sufficient sulphur for the government and commercial purposes to do away with the necessity for importing it from Sicily. There are deposits of immense extent in the Cocopale Country, about 60 miles south of Yuma, which have only just begun to be worked. Recent developments have shown that sulphur in paying quantity can be mined in Ventura, Colusa, and Kern counties, and that the deposits extend into Nevada and Arizona. See ASPHALTUM and PLATINUM.

Greater attention is being paid to the proper storage of water in mountain reservoirs and dams. The water flowing from the Sierra Nevada Mountains is being used, for the production of electricity. In addition to the old mining fields, work is now progressing on quartz lodes in Del Norte, Siskiyou, and Shasta counties. In the latter also, copper mines are developing, as well as in Madera and Plumas counties. River dredging is an increasing factor in the mining, especially on the upper Sacramento. The coal production during 1898 was 136,454 tons.

Agriculture.—The principal farm products and values reported for the calendar year 1898 were: corn 1,184,040 bushels, \$734,105; wheat, 12,224,405, \$8,801,570; oats, 1,943,304, \$971,652; barley, 9,164,746, \$5,957,085; potatoes, 1,939,710, \$1,066,840; rye, 360,711, \$252,498; and hay, 2,335,854 tons, \$33,285,791—total value, \$51,069,541. The growth of the prune industry is one of the marvels of the State. Against the prune orchards of 10 and 12 acres each in France and Italy, which are there considered large, there are a dozen in the Santa Clara and Sacramento Valleys that comprise more than 120 acres and 12,000 trees each. In 1880 there were less than 4,000 acres of prune orchards in the State; in 1890 there were 13,000 acres and 1,300,000 trees planted; and in 1897 there were 53,000 acres of bearing trees. About \$20,000,000 is now invested in the industry, and the annual product is over \$100,000 in value. The farm and ranch animals reported were, Dec. 31, 1898: horses, 342,265; mules, 52,915; milch cows, 318,425; oxen and other cattle, 664,704; sheep, 2,175,545; and swine, 374,141—total head, 3,927,995.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise at the ports of Humboldt, Los Angeles, San Diego, and San Francisco amounted in value to \$43,498,645, and the exports to \$41,972,054. The trade in gold and silver ore, bullion, and coin was, imports \$28,348,306, and exports \$10,733,171—making the total foreign trade of the year \$124,552,176.

Banking.—On October 31, 1898, there were 34 national banks in operation and 17 in liquidation. The active capital aggregated \$10,825,000; deposits \$30,273,077; and reserve \$12,364,116. The State banks on August 31 numbered 176, and had a capital \$31,139,301, deposits \$67,224,396, and surplus \$17,159,017; the private banks numbered 23, and had capital \$964,027, deposits \$1,517,323, and surplus \$235,681; and the stock savings banks numbered 55, and had capital \$7,941,930, depositors 176,241, deposits \$136,119,226, and surplus \$6,588,868. The exchanges at the United States clearing houses in San Francisco and Los Angeles, in the year ending September 30, 1898, aggregated \$871,119,631; increase in a year \$108,810,694.

Railroads.—A new importance was given to the railroad systems of the State by events growing out of the war with Spain, and the fact was recognized by the United States Commissioner of Railroads, who in his official report for the year ending June 30, 1898, suggested that the government construct and operate a first-class double-

track railway from Kansas City, Mo., to San Diego, Cal., by air-line route. This would open the shortest line, measured by the map, from Boston, New York, and Philadelphia to the Pacific coast, and make the most direct route from our great commercial centres to the Sandwich and Philippine Islands. The principal railroad construction of the year was for the purpose of connecting new or recently developed mining districts with the main lines of roads traversing the State. Congress, in July 1898, appointed a commission to settle the indebtedness of the Central Pacific and Western Pacific railroads to the government, growing out of the issue of bonds to aid their construction. During the year the government received \$40,253,605, the balance of the indebtedness to it of the Union Pacific railroad, and \$6,303,000 for its mortgages on the bond-aided portion of the Kansas Pacific railroad, both under legal procedure. The two last roads have an intimate connection with the transportation interests of California.

Education.—At the close of the school year 1896-7 there were 257,929 pupils enrolled in the public schools, of whom 188,849 were in daily attendance. The value of all public school property was \$17,196,996, and the expenditures of the year, including \$4,418,545 paid to 7,178 teachers for salaries, aggregated \$5,847,748. There were 86 public high schools, with 390 teachers and 10,793 pupils; 62 private secondary schools, with 293 teachers and 2,111 pupils; and 4 public and 4 private normal schools, with 71 teachers and 1,657 students. For higher education there were 12 colleges and universities, co-educational and for men only, with 317 professors and instructors and 4,558 students; 2 colleges for women only, with 52 instructors and 83 students; and 4 theological, 2 law, and 6 medical schools. The agricultural and mechanical department of the University of California at Berkeley, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 684 periodicals, of which 112 were dailies, 454 weeklies and 93 monthlies.

Finances.—The total assessed valuation in 1897 was \$1,130,911,181, the lowest since 1890, and the tax rate was \$4.90 per \$1,000. The rate for 1898 was fixed at \$4.88. On March 1, 1898 the total bonded debt was \$2,282,500. There were also special bonds aggregating \$600,000 not included in the regular debt statement because payable from special receipts. The State held in trust for various educational funds \$2,277,500 in bonds of the regular debt and \$200,000 in those of the special.

Population.—As estimated by Federal officials the population on June 30, 1898, was about 1,550,000.

Events of 1898.—The fiftieth anniversary of the discovery of gold in California was celebrated at San Francisco by a week's festivities, commencing Jan. 24th. The city was gaily decorated with flags and bunting and the portrait of James Marshall, who picked up the first gold nugget in 1848, was seen everywhere. A proclamation of Governor Budd's made the day a holiday. A monster parade took place and the Golden Jubilee Mining Fair, showing the mining products of every county in the State was opened. The State suffered somewhat from drought, Tuolumne county especially suffered from lack of water. An earthquake on March 31, caused great damage in San Francisco.

The Republican State Convention reaffirmed its belief in the financial plank of the Republican National platform of 1896 and commended the efforts of the national administration to secure an international monetary agreement, and urged that the attempt should be renewed at every opportunity. The candidates for Governor were: Maguire (Fusionist), Gage (Rep.), McComas (Pro.), and Herman (Soc. L.). H. T. Gage was elected by 19,411 plurality and six of the seven Representatives sent to Congress were Republicans. McGuire's single tax theories contributed to his defeat. In the State legislature the Republicans have a majority of twelve in the Senate and thirty-six in the House. The Insurance Commissioner attempted to secure for the people, from the foreign insurance companies doing business in the State, an equitable reduction of insurance rates, payment of taxes and licenses by insurance companies, and a general abolition of conditions imposed on insurers after the fire underwriters had combined. In June the foreign companies finally accepted the commissioner's regulations for doing business in the State. The California law, passed March 13, 1897, was declared unconstitutional by the Supreme Court of that State in March 1898, on the ground of violation of the secrecy of the ballot. The law provides for an "open" primary. "As each voter approaches to vote, when it is ascertained that he is entitled to vote, it shall be noted in the register by the clerk in which box he votes by writing in the register, opposite his name, the name of the box in which he votes." As this register is public, the secrecy of the ballot is practically done away with. Of the constitutional amendments submitted to the people in 1898 only one out of seven was adopted. This related to the lieutenant-governorship. The proposal for the summoning of a constitutional convention was rejected. The President issued proclamations on March 2 and June 28 setting apart the Pine Mountain and Zaca Lake Forest Reserve and prohibiting settlement.

National Representatives and State Officers.—The Representatives for California

are: John A. Barham (Rep.), Marion De Vries (Dem.), Victor Metcalf (Rep.), Julius Kahn (Rep.), Eugene F. Loud (Rep.), Russell J. Waters (Rep.), and James C. Needham (Rep.). The Senators are: George C. Perkins (Rep.), and another Republican. The officials are: H. T. Gage, Governor; J. H. Neff Lieutenant-Governor; C. F. Curry, Secretary; T. Reeves, Treasurer; E. P. Colgan, Comptroller; J. T. Ford, Attorney-General; T. J. Kirk, Superintendent of Education; M. J. Wright, Commissioner of Public Lands. Chief-Justice Supreme Court, W. H. Beatty; Associates, T. B. McFarland, C. H. Garoutte, R. C. Harrison, W. Van Dyke, F. W. Henshaw, and Jackson Temple. In the State Legislature there are 84 Republicans, 33 Democrats, 2 Populists, and 1 Independent.

CALIFORNIA, UNIVERSITY OF, at Berkeley, California, was established in 1868; it is non-sectarian and co-educational. The university comprises: at Berkeley, the academic department and the department of mechanics, mining, and civil engineering, and a college of commerce; at Mount Hamilton, the astronomical department (Lick Observatory); at San Francisco, the colleges of art, law, medicine, dentistry, pharmacy, and veterinary science. In 1898 the officers of instruction numbered 300 and the students 2,391. Of these there were in the departments at Berkeley 107 teachers and 1665 students; at Mount Hamilton, 10 teachers and 2 students; at San Francisco, 183 teachers and 731 students. During the year 1898, up to November 1, there were conferred: Bachelor degrees, 190; higher degrees, 21; professional degrees, 142. In 1898 there were about 76,000 volumes in the library; the productive funds amounted to \$2,818,748, and the income and benefactions to \$577,451; for 1897-98 the receipts and expenditures balanced at \$216,092. In 1898 an international competition of architects, presenting plans for new buildings to be erected through the generosity of Mrs. Phebe A. Hearst, was held at Antwerp, Belgium; Miss Cora Jane Flood gave the university a mansion and 540 acres of land; many gifts of money and books were received during the year, and the college of commerce was established. This has courses in history and political science, in commercial and international law, in modern languages, including Chinese, and in technical studies, including botany, forestry, agriculture, fisheries, mining, etc. In the latter part of 1897 an expedition, provided for by the late Col. C. F. Crocker, and under the direction of Prof. W. W. Campbell, of the Lick Observatory, went to India to observe the solar eclipse of January 22, 1898. President Martin Kellogg, LL. D., resigned in 1898. See UNIVERSITIES and COLLEGES.

CAMBODIA is a province of French Indo-China, with an area of 46,000 square miles and an estimated population of 1,500,000, composed of various native tribes, together with some 250,000 Chinese and Anamites and 40,000 Malays. The country has been a French protectorate since 1863. Its soil is fertile, producing rice, betel, tobacco, indigo, sugar cane, pepper, maize, cinnamon and coffee. In 1887 it was united with Anam and Tonquin into a customs union and at present it is, together with these two provinces and Cochin-China, subject to the direction of the Superior Council of Indo-China (q. v.), though really administered by its own ruler, King Nerodom.

CAMBON, JULES MARTIN, French diplomat, was born in Paris April 5, 1845; was educated at the Lycée Louis le Grand, completing his course with the lectures at the law university, at which he was graduated in 1866, and was admitted to practice. In the Franco-Prussian war he served with distinction in the division of Seine-et-Marne, and after peace was established he was attached as a chief of bureau to the Algerian Government Department. In 1879 he was made general secretary to the prefecture of police of the Seine, and three years later when his brother, Paul Cambon, left the prefecture of the Department of the Nord to become French Resident at Tunis, Jules Cambon was appointed his successor. In 1889 he was transferred to the prefecture of the Rhone; and in April 1891, was appointed to the responsible position of governor of Algeria. He was appointed in September 1889, to succeed M. Patenotre, transferred to Madrid, as ambassador at Washington, and entered upon his duties in January 1898. Upon the outbreak of the Spanish-American war he was designated by the Spanish government to protect its interests, and he was the Spanish representative in the framing of the protocol of August 12, 1898. His work in representing Spain was worthy of praise from each of the hostile nations. M. Cambon is said to be one of the ablest French diplomats.

CAMERON, MALCOLM COLIN, born in Perth, Ontario, April 12, 1832, died at London, Ontario, September 26, 1898. He practiced law and was a successful politician, being several times elected to the Canadian Federal Parliament from South Huron and West Huron. At the time of his death he was Lieutenant-Governor of the Canadian Northwest Territories.

CAMEROON, or the **CAMEROONS**, region is a German protectorate of West Africa with a coast line of about 200 miles on the Bight of Biafra between the Campo river and the Rio del Rey; bounded on the north by the Niger Territories

and on the south and east by French Congo, with an area estimated at 191,130 square miles and a population of 3,500,000, of whom in 1897, 253 were whites. Its northernmost point is on the southern shore of Lake Tchad. The inhabitants are Bantus and Soudan negroes. The soil in the coast region is fertile along the western slopes of the mountains. The rainfall is abundant and the conditions are good for the cultivation of cocoa and coffee. Among the other products are tobacco, cloves, caoutchouc, vanilla, ginger, pepper, ivory, and palm oil, and gold and iron are said to occur. Here as in the other German colonies, a duty is levied on imports and the revenue is mainly derived from this source. The chief town is Cameroon on the coast, and in the interior are Victoria, Bibundi, Campo and other important trading stations. It was organized as a protectorate in 1884 and is administered by a German imperial governor, assisted by a local council. Its boundary toward the Niger coast Protectorate and Niger Territories was settled by agreements in April 1893, and the respective limits of the French and German spheres were settled in the following year.

CAMPBELL-BANNERMAN, SIR HENRY, G. C. B., M. A., LL. D., Liberal Member of Parliament for Stirling District since 1868, was born September 7, 1836. He was educated at Glasgow University and Trinity College, Cambridge. He was Financial Secretary to the War Office in 1871-74 and 1880-82; Secretary to the Admiralty, 1882-84; Chief Secretary for Ireland, 1884-86; Secretary of State for War, 1886 and 1892-95. He has a reputation for considerable administrative ability.

CAMPBELLITES. See DISCIPLES OF CHRIST.

CANADA, DOMINION OF, occupies the northern part of North America, with the exception of the crown colony of Newfoundland, to which Labrador belongs, and of Alaska, which belongs to the United States. The area is 3,315,647 sq. m.; gross area, including lakes, rivers, etc., 3,456,383 sq. m.; and the population in 1891 was 4,833,239 and in 1898 was estimated at about 5,250,000. According to the census of 1891, 29.4 per cent. of the people were French-speaking and 86 per cent. were natives of British North America. The capital of the Dominion is Ottawa and the chief cities are Montreal, Toronto, Quebec, Hamilton, St. John and Halifax. The provinces are Quebec, Ontario, Nova Scotia, New Brunswick, Prince Edward Island and British Columbia. Besides these, there are the territories and Arctic islands, with an area in 1896 equal to two-thirds of the whole. Parts of the territories have been divided into districts. These districts are Assinaboia, Alberta, Athabasca, Saskatchewan, Keewatin, Ungava, Franklin, Mackenzie and Yukon.

In 1897 the boundaries of Ungava, Keewatin, Franklin, Mackenzie, and Yukon were changed, and in 1898 Yukon was organized as a separate district, with an estimated water surface of 2,000 sq. miles and land surface of 196,300 sq. miles.

Agriculture.—No general statistics of the agricultural and live-stock industries are gathered by the government, excepting in census years, and Manitoba and Ontario are the only provinces that supply anything like full returns. Some idea of the condition of these industries, however, may be derived from the official report on the exportation of their principal products. In 1897 the exports of domestic agricultural and live-stock products amounted in value to \$55,533,592. This included wheat, \$9,265,326; flour, \$1,720,361; other breadstuffs, \$8,813,191; and live stock (horses, cattle and sheep), \$9,872,321. The export of dressed meats aggregated \$6,627,624; cheese, \$14,676,239; butter, \$2,089,173; and eggs, \$978,479. Of the total exportation, an aggregate of \$45,825,601 went to Great Britain, and \$7,090,647 to the United States. See also MANITOBA and ONTARIO.

Mineral Products.—In the calendar year 1897 the mineral productions had an aggregate value of \$28,789,173. The most valuable ones were coal, \$7,286,257; gold, \$6,027,016; silver, \$3,322,905; copper, \$1,501,660; nickel, \$1,399,176; lead, \$1,396,853; petroleum, \$1,011,546; natural gas, \$325,873; asbestos, \$324,700; and cement, \$275,273. The total output of coal was 3,876,201 short tons, of which 2,465,387 were mined in Nova Scotia and 988,796 in British Columbia. In gold, British Columbia had an output of \$2,724,657; the Northwest Territories, including the Yukon district, \$2,550,000; Nova Scotia, \$562,165; Ontario, \$189,294; and Quebec, \$900. Exports of the various mineral productions amounted in value to \$11,906,918.

Fisheries.—The total value of the yield of the marine and fresh water fisheries in the calendar year 1896, was \$20,407,424, Nova Scotia contributing \$6,070,895; New Brunswick, \$4,799,433; British Columbia, \$4,183,999; Quebec, \$2,025,754, and Ontario, \$1,605,674. The most valuable catches were cod, \$3,610,935; salmon (canned), \$2,988,258; herring (pickled), \$2,183,559; lobsters (canned), \$1,526,928; salmon (fresh), \$965,029; whitefish, \$773,345; trout, \$690,699; and lobsters (alive), \$678,834. The industry employed 75,237 persons, and vessels and apparatus valued at \$9,826,251, and was variously promoted by the government to the extent of \$443,587.

Commerce.—The imports of merchandise in the fiscal year ending June 30, 1897, aggregated in value \$119,218,609; exports, \$137,950,253; and the movement in gold

and silver was, imports, \$4,676,194; exports, \$3,492,550; making the total foreign trade of the year, \$265,337,606. Of the total imports \$70,766,316 was from the United States and \$31,562,855 from the British empire; and of exports, \$82,238,023 went to the British empire and \$49,373,472 to the United States. The aggregate trade with the United States was \$120,139,788, and with Great Britain alone, \$106,639,690. Duties collected on imports amounted to \$19,891,997. The figures for the six months ending Dec. 31, 1898, showed an increase in the aggregate trade of over \$14,000,000. The total was \$177,864,318, as against \$163,361,937 for the six months in 1897, and the increase was wholly due to imports, as there was a decrease of \$1,700,000 in exports. Duties in the six months increased by \$2,300,000 over 1897.

Banks.—The official bank statement for June 30, 1897, showed aggregate capital, \$61,949,536; circulation, \$32,366,174; deposits of all kinds, \$214,804,501; liabilities, \$247,766,150; assets, \$335,203,890. Exchanges at the clearing houses at Montreal, Halifax, Toronto, Hamilton, Winnipeg, and St. John, N. B., aggregated \$1,173,448,000, an increase of \$144,450,758 in a year. The government savings banks numbered 2, which had a total of 48,367 depositors and \$16,554,147 deposits; and the post-office savings banks, 779, with 135,737 depositors and \$32,380,829 deposits. Loan companies and building societies reported for 1896, capital, \$42,038,794; reserve, \$11,242,178; deposits, \$19,404,879; liabilities, \$143,296,284; assets, \$143,887,377.

Canals, Railroads, Post-offices.—The amount expended on canal works and maintenance to June 30, 1897, chargeable to capital, was \$69,297,152, and, additionally, from income, \$14,500,344—in all, \$83,797,496. Local reports showed that during 1896 a total of 25,622 vessels, of 4,677,826 tonnage, passed through the canals, carrying 3,413,674 tons of freight, and paying \$326,766 in tolls. Of the total, 4,650, of 1,228,120 tons, belonged to the United States. During the calendar year 1897, the total vessels that passed through the St. Mary's Falls canal was 17,171; tonnage, 17,619,933; freight carried, 18,982,755 tons; value, \$218,235,927; principal kinds of freight, wheat, \$48,654,143; flour, \$40,145,144; iron ore, \$31,901,145; copper, \$24,464,800. The business of this one canal, between the United States and Canada, was far in excess of that of the famous Suez canal. On June 30, 1897, there were 16,550 miles of railway in operation, and 16,687 miles of track laid. The aggregate capital was \$921,858,232; earnings, \$52,353,277; operating expenses, \$35,168,666; passengers carried, 16,171,338; freight carried, 25,300,331 tons. The Dominion government had aided the railways by grants aggregating \$155,627,346; the provincial governments by \$33,474,806; and municipalities by \$18,031,113—in all, \$207,133,265. In addition to the grants, the Dominion governments had paid a total of \$41,890,887 in subsidies to the railways. Post-offices, June 30, 1897, numbered 9,191, and handled in the year 123,830,000 letters, 26,140,000 postal cards, and 101,319,946 packages of various kinds. The revenue of the department was \$4,311,243; expenditure, \$4,897,783; deficit, \$586,540. There were 1,349 money-order offices, which issued 1,162,209 orders, for \$10,683,174 payable in Canada and \$2,304,057 payable in other countries, and paid orders issued in other countries amounting to \$2,245,467.

Education.—For a review of the educational statistics, see the titles of the provinces respectively. Public libraries number 325, with 663,125 volumes, and in all libraries, 480, with 1,874,632 volumes. In Ontario the various mechanics' institutes have been designated public libraries. In 1898 the periodicals in Canada and Newfoundland numbered 907, of which 105 were dailies, 628 weeklies, and 117 monthlies.

Finances.—The revenue of the consolidated fund, in the year ending June 30, 1897, was \$37,829,778; expenditure, \$38,349,760; excess of expenditure, \$519,982; duties of all kinds collected, \$39,458,067; subsidies to provinces, \$4,238,059, and to railways, \$416,955; expended on militia, canals, railways, public buildings, public works, and provinces, \$3,523,160. Customs yielded \$19,478,247; excise, \$9,170,379; taxes, \$28,648,626; and investments, \$1,443,004. The gross debt of the Dominion was \$332,530,131; assets, \$70,991,535; net debt, \$261,538,596; of the gross funded debt, \$218,255,503 was payable in London and \$9,188,638 in Canada. The provincial revenues were \$11,934,061; expenditures, \$12,900,776; and net debts, \$30,963,256.

Militia.—The permanent and active militia, for the year ending June 30, 1899, comprised, permanent officers, 58; sergeants, 137; rank and file, 668—total, 863; active, officers, 3,053; sergeants, 2,989; rank and file, 29,300—total, 35,342.

Population.—As officially estimated the population in 1897 was about 5,185,990. The Indian population was reported at 99,364. There were 285 schools for Indian youth, which had an enrollment of 9,628, and an average daily attendance of 5,357.

Government.—The executive authority is vested in the sovereign of Great Britain, whose representative in the Dominion is the Governor-General and a Privy Council of 15 members who are responsible to the Parliament. The latter body consists of two houses, a Senate of 81 members nominated for life and a House of Commons of 213 members, elected for five years by the people of the provinces in proportion to their population at the last census, but Quebec is always entitled to 65 members. On the basis of the last census (1891), the ratio is one for every 22,688 inhabitants.

HISTORY.

Political Parties.—The two chief political parties are, as in Great Britain, known by the names of Conservatives and Liberals. The former controlled the government, with the exception of an interval of five years, from the time of the establishment of the Dominion in 1867 to 1896, when the Liberals gained a decisive victory. The most prominent Conservative statesman was Sir John Macdonald, who was in office from 1867 to 1891, with the exception of the five years' interval during which the Liberals were in power. In the general election of 1896 the Liberal programme comprised the gradual adoption of free trade, the extension of the suffrage, the promotion of foreign trade, and non-interference in provincial affairs. Their leader was Sir Wilfred Laurier. The Conservatives supported protection and a preferential tariff with a view to directing trade so far as possible to Great Britain and the colonies. They also emphasized the need of internal improvements and favored interference on behalf of the Roman Catholics in Manitoba. Other parties in the field were the McCarthyites, who had withdrawn from the Conservative party, and the Patrons of Industry, a Labor party. In spite of the Roman Catholic vote, which was given wholly to the Conservatives, the Liberals were successful and the House of Commons was made up of 118 Liberals, 86 Conservatives and 8 Independents.

Parliamentary Session.—The third session of the eighth Dominion Parliament opened on February 3, 1898. Among the important measures discussed were the Yukon railway bill, the investigation of the Drummond railway affair, the proposed railway commission, the change in the Federal franchise and the British preferential tariff. The Yukon railway bill had for its object the confirmation of a contract for the building of a railway line which should pass wholly through Canadian territory to the Klondike region. No aid was to be given by the government beyond the grant of 25,000 acres per mile. The route selected was along the Stikine river from Glenora to Teslin lake. The contract required the deposit of security for its fulfillment and an agreement that the road should be in working order by September 1, 1898. It gave the projectors the right to build wharves and docks and protected them for five years against any rival enterprise which should undertake to build along the route of the Lynn canal. After a long debate the measure passed the House, but in the Senate it was promptly defeated. There was some discussion over an alleged deal on the part of the government with the Drummond county railway and the Conservatives appointed committees from their own party to investigate the affair. The report of these committees wholly exonerated any member of the government from the charge of dishonesty. In March a proposal came up for consideration before the House for the establishment of a board of railway commissioners in control of the railway companies of Canada, to enforce the provisions of the railway act and see that the conduct of the companies should conform to the public interests. A franchise measure was introduced looking to the substitution for the existing franchise in Federal elections of a new system, in accordance with which the provincial franchises should prevail. The opposition objected on the ground that Parliament should control the Parliamentary franchise, but the measure passed before the close of the session. It was announced by the finance minister in April that from August 1 the reciprocity clause of the tariff would terminate and the minimum tariff would apply only to the United Kingdom and certain of her colonies. It was also stated that any other British colony might enjoy the benefit of the preferential tariff if it appeared that its own tariff was as favorable to Canada as the latter's was to it.

The School Question in Manitoba.—The Manitoba school difficulty began in 1890 when the provincial government passed a law abolishing sectarian schools. A number of judicial decisions were rendered on the question and the matter was appealed to the Imperial Privy Council. The grievances of the Catholics were not redressed and the Conservative party attempted to interfere on their behalf. This was one of the features of their political programme in the campaign of 1896. The Liberals, who triumphed at that election, opposed intervention in provincial affairs and in general refrained from interfering with the educational system of Manitoba. In 1897 the Pope addressed an encyclical to the prelates of Canada, reviewing the whole question and complaining of the act of the provincial Parliament in abolishing a right which was guaranteed by the act of confederation. He emphasized the necessity of an essentially Catholic education for Catholic children and he lamented the division among Catholics upon the question, saying that all should have united without distinction of party in protesting against the law of the provincial parliament. But in the existing circumstances he urged them not to reject partial satisfaction merely because they were unable to obtain their full rights and he declared his belief that justice would be done them in the long run. In 1898 there were signs that the Roman Catholics in the province were disposed to accept such a compromise as the legal situation admitted.

The third session of the Parliament closed on June 13, 1898. The Governor-General, the Earl of Aberdeen, who had resigned his office, took his official farewell. The new Governor-General, whose appointment was announced on July 25, was the Earl of Minto.

The Anglo-American Commission.—The increasing friendliness between the United States and Great Britain which manifested itself after the outbreak of the war between the United States and Spain, brought about, or at least hastened, the formation of a commission which should adjust the long list of irritating questions involving the relations of the United States with Canada. The principal subjects which the commission was to consider were: "The Behring sealing question; reciprocal mining regulations; the Alaskan boundary and restrictive regulations for the preservation of the fisheries of the great lakes; the North Atlantic fishery question; the boundary question; the alien labor laws and reciprocity of trade." On August 23 the Commission met in conference at the Parliament building in Quebec. Lord Herschell, the representative of Great Britain, was chosen chairman. Both he and all the other representatives were men of high standing and ability in their respective countries. The United States members were Senator Charles W. Fairbanks of Indiana, Senator George Gray of Delaware, Representative Nelson Dingley of Maine, John W. Foster of Indiana, John A. Kasson of Iowa, T. Jefferson Coolidge of Massachusetts. The Canadian representatives were Sir Wilfred Laurier, Premier of Canada, Sir Louis H. Davies, Minister of Marine and Fisheries, Sir Richard Cartwright, J. Charlton, M. P., and Sir James T. Winter, Premier of Newfoundland. A special motive on the part of Canada was the desire to retain her market for fish in Cuba and Porto Rico. Her annual sale to these islands has amounted to nearly \$1,000,000 worth of fish. It is natural that she should wish to keep this trade. Besides this she has been anxious for a long time to secure admission of fish free of duty to the United States market. In return for this she has offered such concessions as the admission of fishermen of the United States to the Canadian shore fisheries within the three-mile limit, and the doing away with other vexatious restrictions. This fishery question is one of the most important of all the subjects discussed at the conference. The objection to allowing the Canadian fish entrance free of duty to the United States was that it would ruin the interests of American fishermen. It was said that the New England fishermen who went every season to the Banks could not compete on equal terms with the Canadians in the American market. An injury to this class of men which would cripple and possibly destroy their trade was a thing very much to be deplored, for though not numerous these fishermen have supplied some of the best seamen in our navy. During the last war fully five hundred seamen of the first class had been engaged in the Gloucester fisheries.

In addition to the topics above mentioned, the commission discussed the transit of merchandise of either country across the intermediate territory of the other; and the facilitation of the conveyance of offenders in the custody of the law officers of one country through the territory of the other. The commissioners received a great deal of information and advice from interested persons in both countries. The most difficult question to settle appeared to be that of reciprocity. The session at Quebec lasted until October 10, with the exception of a recess from September 2 to September 20. Early in November the Commission resumed its work in Washington, D. C., and on December 19, adjourned to January 5th. During its session it seemed to have reached no solution of the fishery question but to have shown a disposition to refer it to arbitration, and in the meanwhile to allow the present status to continue, permitting the American fishermen to obtain privileges in Canadian waters upon payment of the tonnage tax. Reciprocity was the main point discussed during the last two weeks of its session in Washington. It was hoped that a compromise upon a less liberal reciprocity than that desired by the Canadian commissioners would be effected. In regard to the demand of the Canadian Commissioners for free lumber it was reported that the American Commissioners had agreed upon a compromise by which the existing duty would be reduced from \$2 a thousand feet to \$1. Another question under discussion was the framing of an international arrangement in regard to the use of canals, the Canadian Commissioners claiming that since Americans have the use of a Canadian Canal system, the Canadians should by way of compensation enjoy the freedom of the Hudson river to New York City. No definite results of its meetings had been made public by the close of the year.

The Canadian Prohibition Plebiscite.—On coming into power in 1896 the Liberal ministry in Canada promised to give the people an opportunity to express their sentiments regarding the vexed question of the prohibition of the liquor traffic. Provincial votes had been taken in previous years on the question, the results being in each case in favor of the Prohibitionists. In 1892 Manitoba voted 19,000 for and 7,000 against prohibition; in the following year Prince Edward Island voted 10,000 for and 3,000 against; Ontario in 1895 favored prohibition by a vote of 192,000 to

110,000, and Nova Scotia by a vote of 43,000 to 12,000. These votes of course were ineffective in securing prohibition, as the provinces do not possess constitutional authority to enact such measures. No vote had been taken in Quebec before 1898. In August 1898, the ministry appointed September 29 as the day on which a vote on the prohibition question should be taken throughout the Dominion, but this vote was to have no legislative force, although it was understood that the administration would be guided by the vote cast. The Prohibitionists immediately began a vigorous campaign, holding public meetings throughout the country and enlisting the services of almost all Protestant ministers except those of the Church of England; many of these, however, were strong Prohibitionists. The opposition did not resort so much to public meetings, but relied on the vast quantities of anti-prohibition literature, which they circulated in all of the provinces. Even before the election it was feared by many of the more conservative friends of prohibition that the very probable vote of Quebec against the measure might deter the government from enacting national prohibition laws, although the other provinces might strongly favor them.

The plebiscite occurred on September 29, but since there was no election of any candidates for office, and no other question besides that of prohibition under consideration, and since the vote had no legislative force, less than one-half of the qualified voters appeared at the polls. The question to be voted upon was worded as follows: "Are you in favor of the passing of an act prohibiting the importation, manufacture, or sale of spirits, wine, ale, beer, cider, and all other alcoholic liquors for use as beverages?" Aside from the province of Quebec, the aim of the Prohibitionists was not merely to win at the polls, but to secure immense majorities so that the ministry of Sir Wilfred Laurier, in bringing about prohibition legislation, might have the support of a very strong public sentiment. Accordingly the result of the plebiscite was disappointing to the Prohibitionists, for the entire Dominion gave a majority of only about 18,000 for prohibition, while Quebec, which is probably the richest and most influential province, with its French Roman Catholic population, gave a majority of 40,000 against the measure. About half of this majority was given by Montreal, Quebec City, and Hull. The other provinces gave the following majorities in favor of prohibition: Nova Scotia, 17,679; Ontario, about 15,000; New Brunswick, 12,540; Manitoba, about 8,000; Prince Edward Island, 6,160; British Columbia, about 500; Northwest Territories, 488. Almost startling is a comparison of the majority in Ontario in 1898 with that in the provincial plebiscite of 1895, when as is above pointed out, the majority for Prohibition was about 82,000. To a remarkable extent the rural districts were in favor of, and the cities opposed to, the measure. To the latter rule, however, Halifax, St. John, and Winnipeg, were exceptions. The plebiscite placed the ministry in a difficult position. With so strong a minority in six provinces and with an overwhelming majority against prohibition in Quebec, it was manifestly not only inexpedient but unjust to enact a law which so many persons consider incompatible with personal liberty. On the other hand the Prohibitionists had a majority sufficient to cause the downfall of the ministry. But little could have been gained by such a proceeding, for it is more than unlikely that a Conservative ministry would grant the Prohibitionists more than Sir Wilfred Laurier's Liberal one has done. But many of the leading temperance people took a fair-minded view of the situation, as may be seen from the following statement of Mr. J. S. Robertson, Secretary of the Canadian Temperance League: "I do not think, in view of the smallness of the majority, that the government would be justified in legislating on the lines of prohibition..... Much as I should like to see prohibition, the vote has shown that prohibition at the present time is impossible, especially with a large majority from one of the provinces against it. I doubt whether the government, even if it attempted to make a prohibitory law, could pass it."

CANALS. Canal construction in recent years has been confined to ship canals capable of passing ocean vessels and to the construction of canals for special purposes, such as water power, drainage, etc. About the only work done on boat canals has been in the nature of enlarging the prism in isolated instances and in improving existing structures and mechanical appliances. The following paragraphs cover the most notable recent work of these several kinds.

Aqueducts.—A recent development in aqueduct construction for carrying canals across waterways or depressions in the ground is the employment of steel, instead of masonry and wood in their construction. The older canal aqueducts were generally masonry arch structures, but occasionally they consisted of wooden troughs carried by masonry piers. This latter type of construction is still maintained, but troughs of steel are substituted for those of wood. A notable example of this latest type of canal aqueduct is that which carries the new level recently built to connect the Loire and the Briare canals across the River Loire in France. It is 2,173.6ft. long and 20½ft. in clear width with a depth of water of 7.216 ft., and consists of a continuous trough-shaped steel tank carried on masonry piers. Altogether there are 14

piers and three abutments carrying 15 spans of steel trunk each 131.2 ft. long and one span 39.85 ft. long. The main supporting members of the trunk are two parallel plate girders which form its sides. These girders are 11.15 ft. deep and are spaced 23.8 ft. apart. Riveted to the girders is a bottom framing of transverse and longitudinal girders carrying the steel plate flooring, or bottom, of the trough. Brackets attached to the outside of the main plate girders carry the tow paths, and similar brackets on the inside support the footpaths and fender timbers. The total cost of the steel trunk including the guard gates at each end and miscellaneous constructions was \$248,605 and the total cost of the entire structure was \$561,342.

The steel trunk aqueducts designed for the New York State canals improvements (see following paragraph on Boat Canals), but never built, consisted of an I-beam bottom and side framing, carrying a bottom and side plating of convex buckle plates of steel. The bottom buckle plates were filled with a binder of asphalt to protect them and to prevent leakage. The troughs had a clear width of 56 ft. 5½ ins. and a depth of 9 ft.

Boat Canals.—Since the great extension of railways the building of canals for transportation has been confined to ship canals capable of passing ocean vessels and to reconstructing existing boat canals. The most notable work of the last named character which has been undertaken recently is the deepening of the New York State Canals, comprising the Erie canal, 350.5 miles long, the Oswego Canal, 38 miles long, and the Champlain Canal, 65 miles long. This work was begun in 1896 and as planned consisted in deepening the prisms of these canals 2 ft., making the Erie 9 ft. deep, and the Oswego and Champlain each 7 ft. deep. In some respects the history of this improvement is one of the most important developments of recent years in American canal works.

By the New York State constitution all appropriations in excess of \$1,000,000 have to be approved by popular vote. Hence in 1895-6, after several years agitation to that end by the canal interests of the State, the State legislature passed a bill requiring the people to vote upon the granting of an appropriation of \$9,000,000 to be expended in canal improvements. This appropriation was voted upon on November 5, 1895, and the majority of votes in affirmative was very large. Surveys were begun on January 13, 1896. The letting of contracts followed the completion of the surveys and in the winter of 1896-7—the season of closed navigation—work was begun deepening the prism, and was continued until the opening of navigation again in May 1897. Work was resumed upon the closing of navigation in the following autumn and additional work was contracted for. In December 1897, the State engineer sent out the statement that the \$9,000,000 appropriation would fall some \$5,000,000 short of the sum necessary to complete the work as planned. Vigorous charges of extravagance and misappropriation of the canal funds were made by the daily papers against the canal officials and the conflict was carried into the State Legislature, which finally passed a resolution ordering the Governor to appoint a commission to investigate and report upon the work in the light of the charges which had been made. Meanwhile in April 1898, construction was discontinued, the \$9,000,000 having been expended.

The Governor's investigating commission submitted its report on July 30, 1898, which showed the condition of the improvement at the time work was discontinued to be as follows:

	Completed miles.	Incompleted miles.	Not contracted miles.
Erie canal.....	53.19	214.	83.497
Champlain canal.....	5.886	24.03	36.11
Oswego canal.....	6.63	6.73	24.11
Total.....	65.706	244.76	141.017

Of the total \$7,937,903 expended for work done on contracts, the commission reported that \$1,000,000 in round figures had been improperly expended. Numerous specific instances of this wastefulness were given. As a result of the report the Governor assigned Judge Edwin Countryman to make a special study of the testimony taken by the Commission and to report whether civil or criminal proceedings should be instituted against any person or public officers by reason of acts in connection with the canal work. Meanwhile on September 12, 1898, the State engineer and the Superintendent of Public Works of the State submitted an answer to the report of the investigating commission, which was substantially a denial, both general and specific, of the charges contained in the report. Judge Countryman submitted his report in December, 1898. This was very voluminous, but its general conclusion was that, while corrupt collusion with the contractors was not shown on their part, yet both the State Engineer and the Superintendent of Public Works

were guilty of various infractions of the law; and it advised that the evidence against both these officials be submitted to the grand jury. Immediately after the report was made public the Governor ordered the Attorney-General to institute criminal proceedings against the two officials.

Later a new set of State officials having meanwhile come into power as the result of the November elections, the State Senate called for estimates for completing the work contracted for and partly completed when construction was discontinued in April 1898. This estimate showed that in addition to the \$9,000,000 already spent the sum of \$3,780,816 would be required. Meanwhile numerous claims for damages had been filed with the court of claims on account of the canal contracts. As estimated by the investigating commission the total cost of completing the improvement as planned would aggregate over \$21,000,000. Continuation of the work requires a vote of further appropriations by the people, and this cannot be had before November 1900.

The physical problems connected with the New York State canals improvements were generally of no great difficulty. As already stated the work consisted in deepening the canal prisms 2 ft. This was done either by excavation or by raising the banks and sometimes by combining both methods. The methods of work in either case were simple, as was also the work of deepening the locks by raising the side walls. Lowering the lock floors, however, was more difficult as the old side walls had to be shored up and underpinned with new material. See paragraphs on Aqueducts and Lift Locks.

The only new boat canal actually being built in the United States is the Illinois and Mississippi canal designed as a short route from the upper Mississippi River to Lake Michigan in connection with the existing water routes of Illinois. It extends from Hennepin, Ill., to Rock Island, Ill., 77 miles, of which 50 miles are canal and 27 miles are slack water navigation down the Rock River. The canal proper and the summit level feeder will be 7 ft. deep and 80 ft. wide at water level. The feeder will be 34.75 miles long. There will be 37 concrete locks, 35x70 ft., with lifts of from 3 ft. to 10 ft. Construction was begun in July, 1892, and on January 1, 1899, about 18 miles of canal and 28 of the locks had been completed. The canal is being built by the United States government.

Drainage Canals.—The construction of large canals for sanitary and drainage purposes has called for some of the most important canal engineering of recent years. Prominent systems of this character have been put under way at New Orleans, La., Chicago, Ill., and at the City of Mexico, Mexico.

The City of New Orleans lies between the Mississippi river and Lake Pontchartrain and is highest along the river bank from which the land gradually slopes for about 9,000 ft., dropping in this distance some 13 ft., and then runs nearly level to the lake. The proposed drainage system applies principally to the removal of rain-water from the city area, which cannot drain into the river and which is very large in amount owing to the heavy precipitation here, and, secondarily, it applies to the removal of a portion of the groundwater, which at present saturates the soil and creates unsanitary conditions or makes property in certain sections useless. This total territory was divided into five drainage districts to each of which ran branch canals, with constantly decreasing capacity, separating into main drains, branch drains, and surface gutters extending to the limits of the district. These branch canals empty into a main canal seven miles long emptying into Lake Borgue. This canal is 70 ft. wide at the water-surface with a depth of 15 ft. and a capacity of 3,000 cu. ft. per second. The scheme includes besides the system of canals and drains, several pumping plants for raising the water from one level to a higher one at various points. The total estimated cost of the system is about \$8,000,000, and the work of construction is now in progress. It will be noticed that the dimensions of the main canal are greater than those of many boat canals.

The Chicago Main Drainage channel now approaching completion is, however, the largest canal ever constructed for sanitary purposes. It extends from the Chicago River in Chicago, Ill., to the Desplaines River at Lockport, Ill., 28 miles. Its section in rock is rectangular 160 ft. wide and 22 ft. deep; in earth trapezoidal 202 ft. wide on the bottom and 22 ft. deep, with side slopes of 1 on 2. These sections will pass 600,000 cu. ft. of water per minute, with a velocity of current of 1.26 miles per hour in earth and 1.92 miles per hour in rock. As only one-half this volume of flow is required at first the soft earth sections of the canal, which can be dredged larger after the water is turned in, have been made only 110 ft. wide on the bottom. The total amount of excavation is about 40,000,000 cu. yds., about 12,000,000 cu. yds. being solid rock. Total estimated cost \$28,411,000. This cost includes subsidiary works, comprising the diversion of the Desplaines River, which crossed the canal route several times, and its widening below Lockport to receive the canal waters; the enlarging of the Chicago River to admit 300,000 cu. ft. of water per minute to the canal; the construction of regulating works to control the outflow at Lockport;

and minor works of bridges for railway and highway crossings, etc. The regulating works comprise 15 vertical sliding sluice gates each 30 ft. wide and a bear trap dam 160 ft. long. The canal will take its water from Lake Michigan through the Chicago River, reversing the current of that stream into which the sewage of Chicago flows, and will discharge into the Desplaines River, whose waters empty into the Illinois River and thence into the Mississippi. This will keep all sewage out of Lake Michigan from which Chicago gets its water supply, which is the object of the canal.

Construction was begun in September 1892, and will be completed during 1899-1900. Wet excavation in earth, about 4,500,000 cu. yds., was done with dipper dredges in hard material and hydraulic suction dredges in soft material. For dry earth excavation steam shovels were used, loading into cars hauled to the spoil banks by locomotives, by teams and by stationary engines up cable inclines. Rock was broken by blasting and loaded by hand into buckets and cars, which were hauled to the spoil banks by cable inclines, teams, derricks, cranes, cableways, etc. The cost of earth excavation was 28.94 cts. per cu. yd. and of rock excavation 76.31 cts. per cu. yd. At the busiest times 8,000 men were employed on the work. The work was carried out by the sanitary district of Chicago through a board of trustees of nine members, who organized five executive departments, (1) department of construction; (2) department of law; (3) clerical department; (4) treasury department, and (5) police department, to execute their orders.

The City of Mexico drainage canal is one of the most notable examples of drainage engineering in the world. This city lies in an elliptical shaped valley 37 miles wide and 50 miles long enclosed by a wall of mountains. This valley has no natural outlet for its drainage, which however is collected by several lakes from 3 ft. to 15 ft. above the city level. The highest of these lakes, Zumpango, formerly emptied into Lake Texcoco, but an effort was made in 1607 to divert it into the Moctezuma River flowing into the Gulf of Mexico. For this purpose a great channel 21,650 ft. long, from 30 ft. to 150 ft. deep and in some places 300 ft. wide was begun in 1607 and completed in 1789, after nearly 200 years of intermittent work. This channel only partly served its purpose as it simply draws off the excess of Lake Zumpango and thus relieves the pressure on Lake Texcoco. The Mexican Central railway now enters the Valley of Mexico through this picturesque portal. Various later schemes for draining the valley were brought forward, but it was not until the partial inundation of the city in 1865 that the problem was actively undertaken. Mr. Francisco Garay, the well known civil engineer, then proposed an open channel from the city 165,243 ft. long to a tunnel through the mountains 29,421 ft. long. Work was begun several times, but was interrupted, and it was not until 1885 that President Diaz appointed a commission to carry it through. The present project consists of a canal from the gate of San Lorenzo, 29½ miles long, following the eastern side of the Guadalupe range between those hills and Lake Texcoco, changing its route before reaching mile 12 to a northeasterly direction so as to cross Lake San Cristobal diagonally, also a part of Lake Xaltocan and Lake Zumpango and then to the mouth of the tunnel near the town of Zumpango. The tunnel, a modification of the Garay project, has a length of about 32,870 ft. and was completed in December 1894. At its beginning the canal cut has a depth of 18.04 ft., which is increased in the last few miles to 82 ft. The side slopes are at an angle of 45 degrees. The bottom width is 18 ft. for the first 12½ miles and 21.3 ft. for the remainder of its length. The capacity of flow is 636 cu. ft. per second. The total amount of excavation was about 14,928,000 cu. yds. The rough excavation of the canal was completed in 1895 and the water was turned into it, but the work finishing the side sloping is yet in progress. The total cost of the canal was \$3,500,000. This drainage canal and tunnel take the sewage of the City of Mexico as well as the drainage of the valley.

Lift Locks.—Vertical lift locks for canals although employed long previously have come into recent prominence through the proposition to use at least one and perhaps two to overcome the two greatest lifts on the Erie canal at Lockport and Cohoes, N. Y. Simply described a lift lock is a trough or tank holding water into which vessels are floated and which is raised and lowered bodily between the two canal levels by means of hydraulic or other power aided sometimes by counterweights or flotation tanks. Such lift locks have been built at Anderton, England, in 1875; at Fontinettes, France, in 1885; at Louvière, Belgium, in 1888, and at Heinrichenberg, Germany, in 1895. This last lock had a tank 229.6 x 28.2 x 8.2 ft. with a lift of 62.48 ft. This tank is carried on six flotation cylinders working up and down in suitable circular wells, and is guided by four vertical framework guides placed at the corners. Vertical screws at these guides operated by electric motors supply the excess power over flotation to raise and lower the tank.

In the Erie canal work three comparative plans were completed for a lift lock at Lockport, with a trough approximately 225 x 191-6 x 9 ft. and a lift of 54.43 ft. Two of these plans provided for suspending the troughs by cables and operating them by

two distinct hydraulic methods. The other plan provided for the use of compressed air for operating the trough, and was the plan finally adopted. The work never advanced much beyond the completion of the plans owing to the lack of funds which finally stopped work on the canal improvements. See paragraph on Boat Canals.

Ship Canals.—The outlook for a ship canal joining the Atlantic and Pacific oceans across the American isthmus is more favorable than it has been for many years, and both the Nicaragua and Panama schemes have been prominently agitated during 1898. The Panama canal across the Isthmus of Panama, 46.2 miles long, was begun in 1881 and abandoned in 1889, after an expenditure of \$156,400,000 and the completion of about two-fifths of the work. It was begun as a sea level canal but was afterwards changed to have four locks. Great scandals involving the disgrace of many prominent men, including the engineer, Ferdinand de Lesseps, signaled the liquidation of the canal company's affairs. They were finally placed in the hands of a receiver, who maintained control until 1894, when the concession and assets were turned over to a new company which had been organized. This company began a thorough study of the engineering and financial problems through its own engineers and afterwards through an international commission of engineers numbering 14 members, of whom Brig.-Gen. Henry L. Abbott, U. S. Engineering corps, and Mr. A. Fteley, N. Am. Soc. C. E., were Members from the United States. This commission made its report in December 1898, and the following description is based upon this report.

The canal extends from Colon on the Atlantic to Panama on the Pacific coast, 46.2 miles including 3.35 miles dredged in the Pacific to deep water. The profile of the canal presents in the central part a high summit—the Cordilleras—from which the ground slopes gradually although irregularly towards the low grounds adjacent to the sea coasts. Starting from Colon the canal is now navigable for about 11.8 miles, the depth varying from 16.4 ft. to 29.5 ft. From mile 11.8 to mile 26.7 excavation is proceeding the entire distance with cuts at Bohio, 131.2 ft. deep and at San Pablo and Matachin, 82 ft. and 98.5 ft. deep respectively. From the 28th mile rises the central mass of the Cordillera making the great Culebra cut, which has already been excavated to a depth of 164 ft. The slope towards the Pacific is now reached, with a cut of from 49 ft. or 65 ft. to 196.5 ft. diminishing at the 40th mile to 6.5 ft. to 16.4 ft. From this point to the Pacific the canal has been excavated to the depth of from 6.5 to 26.2 ft. From mile 42.8 to the great depths at Naos at mile 49.5, the canal is completed so as to be navigable to a depth of from 16.5 ft. to 29.5 ft., which was recently excavated by the new company to an average depth of 27.8 ft. In brief the work already done constitutes fully two-fifths of the entire council work.

The commission established the summit level of the canal in the Culebra cut at 68.08 ft. above the sea and gave it a bottom width 118.11 ft. and a length of 318.35 ft. The next level east from Obispo to Bohio was given a bottom width of 164 ft. and a length of 13.37 miles. The final Atlantic level was given a bottom width of from 98.4 ft. to 111.5 ft. and a length of 14.84 miles. The first level west of the summit level was made 7.963 ft. and the two following were made 7.930 ft. and 4.69 miles long, respectively, not including the dredged channel 3.36 miles long. Between the different levels are double locks, the working length of both being 738.22 ft., and the width of one 82.02 ft. and of the other 59.05 ft., with an intermediate gate. The depth of water in the locks is to be generally 29.5 ft. and is not to exceed 32.8 ft. It is designed that the slopes of the canal especially in the deep central cut are to be protected by a stone rivetment. Of the 46 miles of the canal 26.75 are straight and 15 miles have radii equal to or not exceeding 9,850 ft., except in one case where the radius of curvature is 8,200 ft.

For a considerable part of its length the route of the canal is in the valley of the Chagres river, a torrential stream which although inconsiderable in dry times is subject to sudden and sometimes enormous freshets. It was necessary therefore to divert or regulate this stream in such a manner as to protect the canal from damage. The means adopted to regulate the flow is to erect two large dams. One of these dams will be located at Bohio and will be of earth with a depth of water against it of 65.62 ft., making a reservoir 21.5 square miles in area and of a capacity of between 196,200,000 and 261,600,000 cu. yds. of water. The other dam will be located on the Upper Chagres about $9\frac{1}{2}$ miles from the canal. This will be built of concrete masonry 134.5 ft. high and 936.75 ft. long on top and a height of 164 ft. above the canal. The reservoir formed will have a capacity of from 130,800,000 cu. yds. to 170,000,000 cu. yds., and one of its functions will be to supply the summit level with water through a feeder canal $9\frac{1}{2}$ miles long and 6,605 gallons per second capacity starting at an elevation of 190.25 ft. above sea level. The reservoir will also furnish hydraulic power for generating electricity, for operating the locks and lighting and power purposes generally. Both dams can consequently accumulate at least 60,000,000,000 gallons, which, with proper adjustable weirs are more than sufficient to control the largest freshet. See CENTRAL AMERICA (Map).

The estimated cost of completing the canal is given by the commission as \$102,400,000. The concession for the Panama canal was granted May 28, 1878, extended Dec. 26, 1890, and Aug. 4, 1893. The time for the completion of the canal is thereby fixed at October 1904, but in December 1898 the Columbian government granted an additional extension of six years subject to the formality of ratification of Congress when it reconvenes. This is an exclusive concession. The commission states that for four years there have been continuously employed from 3,000 to 4,000 workmen on the canal works besides a large force of engineers and at the end of 1898 that number was at work.

The Nicaragua Canal is in some respects the more notable of the two inter-oceanic canal schemes. This canal as projected extends from Greytown on the Atlantic to Brito on the Pacific coast, a distance of 170 miles of which 29 miles are canal proper and 141 miles are river and lake navigation. The first concession was granted in 1849, abrogated for non-fulfillment of conditions in 1856, and renewed in 1857. In 1889 the Maritime Canal Co., was incorporated by the Congress of the United States, and preliminary work on construction begun. By October 1890, about \$2,000,000 had been expended mostly in surveys and harbor and terminal work at Greytown. Work was, however, discontinued in 1893 as money to continue it could not be obtained from private investors. Since 1893 bills disposing of the concession to the United States have been introduced at nearly every session of Congress and have failed of passage. In 1895, however, Congress authorized a commission to investigate the canal company's plans and estimates which placed the cost of the canal at \$87,000,000. This commission made a preliminary estimate of \$133,472,000 as the cost of the canal and recommended that further surveys and studies be made to secure data for final estimates. In 1897 another commission was appointed to make the suggested further investigations and this commission has not yet presented its report. In the fall of 1898 the Nicaraguan government announced that the Maritime Canal Co.'s concession expired in October 1899, and about the same time it granted a concession to Mr. Edward Eyre and Mr. Edward F. Cragin of New York to take effect when the older concession expired. A syndicate headed by Mr. William R. Grace of New York has been organized to build the canal on the Eyre-Cragin concession employing private capital. See CENTRAL AMERICA (Map).

The general scheme of the various bills which have been introduced into Congress by the Maritime Canal Co. has been to have the U. S. government guarantee the bonds of the company to the amount of \$100,000,000—this amount has gradually become smaller as the years passed—and receive the company's stock in payment. In the Congress of 1897-8 the bill proposed to give the canal company's stock and bondholders and creditors \$4,500,000 in bonds and \$7,000,000 in stock in exchange for their holdings. The bill presented to the Congress of 1898-9 proposed to give the canal company \$5,000,000 in bonds and to pay its debts. The old company was in fact to disappear and the new company under the same name was to be practically a department of the United States government, all its directors being appointed by the President. The Senate passed this bill after making several radical amendments which provided, that: The payment made to the Maritime Canal Co. should be only such an amount as the "rights, privileges, franchises and property of the company are actually worth in cash," this amount to be determined by three commissioners to be appointed by the President; that no payment should be made unless the President "shall decide to construct a canal under the concessions granted to the canal company;" and, finally, that should the President fail to receive the necessary extensions of concessions he should take steps to negotiate for some other route for a maritime canal. The House of Representatives "amended" the Senate bill by striking out every thing but the first clause and substituting an entirely new bill, which provided that the President should purchase from the governments of Nicaragua and Costa Rica the necessary territory on which to construct a ship canal and appropriated \$115,000,000 for building the canal through this territory. This bill failed to pass the House. The House Bill was then attached as an amendment to the River and Harbor Bill in the Senate and to the Civil Service Bill in the House.

Water Power Canals.—Another class of canals which has recently assumed importance is that employed in developing water power. The two most important canals of this class are the Massina Canal in New York and the Sault Ste. Marie Canal in Michigan. The Massina Canal is designed to divert a portion of the waters of the St. Lawrence River and carry them 16,200 ft. over a comparatively level plateau to the gorge of the Grasse River where a fall of 42 ft. can be secured. The prism of this canal is 187.5 ft. wide on the bottom, with a depth of water of 25 ft. and side slopes of 1 on 1½, which made the width at water level 262½ ft., and is the largest canal prism ever excavated. Altogether the excavation will amount to about 8,000,000 cu. yds. The Sault Ste. Marie canal is designed to divert a portion of the water of the St. Marys river above the rapids which has a fall of some 19 ft. in 3,500 ft. and carry it to a power house in sufficient volume to develop 40,000 horse-

power. The canal in rock has a rectangular section of 200x22 ft., and in earth a trapezoidal section of 174 ft.x22 ft.x218 ft. In the earth section the bottom and sides of the prism are rivetted with timber to prevent scour by the current.

CANARIES, or **CANARY ISLANDS**, a group of islands in the Atlantic ocean belonging to Spain, and lying off the northwest coast of Africa. They cover an area of 2,808 square miles. The population (1887) was 291,625. For administrative purposes they are regarded as a part of Spain. The principal islands are Teneriffe, Grand Canary, Palma, Gomera, Lanzarote, Fuerteventura, and Hierro, or Ferro. The chief products are cereals, tomatoes, bananas, and potatoes.

CANCER. See PUBLIC HEALTH.

CANDIA. See CRETE.

CANTILEVER BRIDGES. See BRIDGES.

CAPE COLONY proper is that district of southwestern Africa which is bounded on the north by the Orange river and the Kei, but in recent years the outlying districts to the north have been successively annexed. The following table taken from the *Statesman's Year-Book* of 1898 shows the area and population of the Colony and these annexed territories according to the census of 1891:

POPULATION IN 1891.

	Area. sq. m.	European or White.	Colored.	Total.	sq. m.
Cape Colony proper.....	191,416	336,938	619,547	956,485	5.00
Griqualand West.....	15,197	29,670	53,705	83,375	5.49
East Griqualand.....	7,594	4,150	148,468	152,618	20.10
Tembuland	4,122	5,179	175,236	180,415	43.77
Transkei	2,552	1,019	152,544	153,563	60.16
Walfisch Bay	430	31	737	768	1.79
Total.	221,311	376,987	1,150,237	1,527,224	6.90

Only about one-third of the population are whites and of these the Dutch are the more numerous. Besides those districts mentioned in the table Pondoland was annexed in 1894 having an estimated area of 4,040 and a population of 166,080, and British Bechuanaland, formerly a crown colony was annexed in 1895, having an area of 51,574 and a population of 72,736. The chief towns are Cape Town with a population of 83,718 (including its suburbs), Kimberley, Port Elizabeth, Graham's Town, and Beaconsfield.

Production and Commerce.—The mineral wealth of the colony is extensive. Gold and diamonds are the most important mineral products and they are exported in large quantities. Kimberley has for some years been the centre of diamond mining and owes to this a very rapid growth. Other minerals found are copper, coal, manganese, lead ore, iron ore and zinc blende. Manufactures have been developed in recent years. The leading exports are gold and diamonds which in 1897 amounted respectively to £11,991,926 and £4,450,376. Both in respect to exports and in respect to imports Great Britain and her colonies control by far the greatest portion of the trade. The coal which is found in the colony is wholly inadequate for the needs of the inhabitants and almost all of the coal used is brought from Cardiff, South Wales. American trade has not developed as rapidly in the Cape as that of some other countries, especially Germany. The American manufacturer is dependent upon competitors for the shipment of his goods and the collection of his drafts. The United States Consuls in South Africa suggest many ways in which the American merchant may extend his trade connections, and point to the example set by the German and English manufacturers in adapting themselves to the needs of their customers. Among other suggestions it has been proposed that the United States should open an exposition showing samples of American produce. The wages of labor are on the whole very high, but it must be remembered that the cost of living is higher than in the United States. Among the rates of wages quoted by the American Consul-General at Cape Town on April 1, 1898, are the following: brick layers \$19.50 per week, boiler makers \$16.50 per week, bakers \$16.50 per week, blacksmiths \$15.00, carpenters \$18.00, curriers \$20.00, cabinet makers \$20.00, engineers \$15.00, harness makers \$15.00, gas-fitters \$15.00, masons \$15.00, tailors \$20.00. Cape Colony produces large quantities of tobacco, wheat, oats, mealies, corn, rye and hay; besides pastoral products including wool, mohair, butter, ostrich feathers, etc. There are very extensive sheep farms and the number of sheep raised is large. Figures quoted by the United States Consul in 1898 show a steady increase of the square miles devoted to sheep farming since 1856. Between 1891 and 1895, however,

there was a falling off in the number of sheep and in the amount of wool obtained. As to the commerce in 1898, it appeared from the Consul-General's report that in the imports there was a considerable falling off during the first three months of 1898 as compared with the first three months of 1897, while the exports showed an increase during the same period. Important changes were proposed to Parliament in regard to the tariff in 1898, these changes showing on the whole a considerable increase over the existing rates.

Government.—The constitution in its present form dates from the year 1872. It provides for a responsible government the executive being vested in a governor with a ministry of five members, and the legislative authority in two elective chambers. The upper house or Legislative Council consists of 23 members chosen for 7 years and the lower house or House of Assembly of 25 members chosen for five years. The Governor in 1898 was Sir Alfred Milner K. C. B.

Political Situation.—In 1898 occurred the first of the elections for the Legislative Assembly since the Jameson Raid, and it is interesting to note the influence of the Raid on the present condition of the political parties. It must be remembered in studying Cape politics that the government is not a party government, and that it may continue in office when it has not a majority of adherents. No great principle divides the political parties, and the main motive which retains a government in power is the mere instinct of self-preservation. One of the chief political factors is the so-called *Africander Bond*, which has for its objects the promotion of the *Africander* interests, and the stimulation of national *Africander* feeling. It is strongest among the farmers and in the small rural towns. It cannot be called a political party, but is rather a nationalist organization, with a definite racial programme. The party groups down to the time of the Raid were thus divided: In the first place there was the Rhodes group, which was held in power by the *Africander Bond* until the time of the Raid and from motives of self-interest maintained friendly relations with that organization. Secondly, there was the *Africander Bond* itself, very conservative in tendency and with the race question always in mind. Thirdly, there was the Progressive group, which was the party of the opposition, disliking the conservative policy of the Bond, and opposing Rhodes on account of his friendliness toward the latter. The effect of the Jameson Raid was merely to divorce the Rhodes group and the *Africander Bond*. As a result of this, a good many of the Progressives were won over to the side of the Rhodes party, from which they had hitherto been kept on account of the alliance between it and the Bond. But the Bond group received recruits at the expense of the Progressives, for there were many of the latter who placed nationalist interests before a liberal internal policy.

The Rhodes group as is well known stood for the principle of imperialism or colonial expansion. Rhodes had shown himself something of an opportunist, ready to employ somewhat devious means in the attainment of his ends. Just as he allied himself to the Bond down to the time of the Raid, he now made overtures to the Progressive party to lift himself into power. Putting aside for the moment the nationalist and imperialist questions, it appeared that the respective party groups maintained the following attitudes toward matters of internal policy. In the first place as to the question of taxation: in Cape Colony taxes rest upon the necessities of life, such as bread-stuffs, meat, butter, cheese, etc., while luxuries including diamonds, native wines and spirits etc., are untaxed. Large incomes escape taxation, and one-fifth of the revenue raised by taxation is derived from taxes on necessities. The result is clearly to enhance the cost of living. Now the attitude of the Bond toward this question was controlled by the fact that its constituency was largely agricultural. It objected to the abolition of duties on food. The attitude of the Rhodes party was somewhat undecided. While desiring to protect the agriculturalists, Mr. Rhodes had expressed himself in favor of a compromise, seemingly admitting the iniquity of high taxes on necessities, and the exemption of luxuries. The Progressives, of course, favored thorough reform in this matter of tax policy. Many of them urged the taxation of those who were deriving wealth from the mineral resources of South Africa, instead of unjustly taxing the necessities of the poor. Some of the Progressives had tried to lay an increase of legacy and succession taxes. On the whole, however, none of the party groups had a definite programme in regard to taxation.

Another important question of domestic policy was the native question. The British treatment of the natives in the past had been on the whole fair. It will be remembered that abolition of slavery was one of the main causes which led to the exodus of the Boers, but of late years there has been a tendency to abuse the natives, or at least to regard them merely as a source of profit to the whites. A prominent Progressive of Cape Colony, writing in the *Westminster Review* of August 1898, pointed out the injustice of the government's treatment of the Langberg rebels. A revolt having broken out in a part of Bechuanaland, Cape Colony sent a force there to suppress it, and punish the insurgents. The campaign was successful, and the

punishment of the natives consisted in the wholesale deportation of the population to Cape Town, where they were bound out as apprentices to farmers, for a period of five years. It thus seemed, as this writer urges, that the government adopted a wholly different policy in dealing with the natives from that which it followed in dealing with the whites. The Progressives condemned this, and cited it as an instance of moral deterioration in the treatment of the natives. The other parties either upheld this policy or were divided on the subject. The Bond was not in favor of reform, for cheap labor was naturally to the interest of the farmers. The Rhodes party apparently had no definite views on the subject. The Progressives favored a more humane policy toward the natives, and obliteration, as far as possible of the foolish color prejudice, which is carried so far at the Cape, that, as the writer above quoted puts it, "If Prince Ranjitsinhji came to South Africa, he would not be allowed, according to the rules of the Cape Cricket Club to play in a first class match."

The third question of importance is the educational policy of the government. The attendance at schools is low. The payment of teachers is insufficient, and the instruction is poor. The Progressive party were united in favor of compulsory education, and condemned the apathy of the government in the past, although they admitted that considerable progress had been made during the last five years. Many in the other party groups were in favor of educational reform. Mr. Rhodes subscribed to what is known as permissive compulsion, that is to say, each district to decide whether it was willing to have compulsory education, but even if it rejected the measure it was to be called upon to contribute its share to the expenses of education throughout the country.

The fourth question concerned the sale of intoxicating liquors to the natives. For a long time the Progressives had labored to secure this reform, as well as to introduce an excise. As to the prohibition of the sale of liquor to the natives a bill had been brought in by the Hon. Rose Innes, the head of the Progressive party, which received support from many in the other party groups. The Bond generally had been opposed to an excise. Mr. Rhodes had declared in favor of the prohibition of the sale of liquor to the natives.

Such were the main party issues, during the first half of the year 1898. The most interesting feature of Cape politics was the programme of the Rhodes group. Mr. Rhodes had previously appeared to the Progressives as a champion of retrogressive measures. He was opposed to an excise, frequently declared himself in favor of duties on the necessities of life, and at one time advocated the increase of duties on breadstuffs. As a matter of fact his aims and ambitions had had little to do with matters of internal policy. He had treated these matters apparently from a merely opportunist point of view, trying to gain a sufficient following by party alliances, to realize his schemes of colonial expansion. After the rupture of his party with the Bond, he gradually veered toward the Progressive ideas, and in 1898 put forward a platform comprising the abolition of duties on meat, compulsory education permissive by districts, restriction of the sale of liquors to natives and other measures of a more or less liberal and progressive nature. His opponents did not neglect this chance to ridicule him for these changes of purpose. He himself, perhaps, furnished an explanation of this change of attitude by his contemptuous use of the phrase "parish-pump politics."

It was the object of the Progressives to turn public attention toward the matter of domestic reform, and away from the racial question, which had been the most disturbing factor in political life. The feeling of race antagonism between the Boers and the English had always been bitter, and hostilities frequently threatened to break out between the Transvaal and Cape Colony. To an outsider it would seem that this question would settle itself in the natural course of events, for sooner or later immigration must give so decided an advantage to the English element that the state will be constructed according to their own wishes. This, for instance is the view of Mr. Bryce who recommends to the English of South Africa, and to the British government "an attitude of patience and strict adherence to legal rights." The Boers are not prolific and their numbers are not being augmented from without. It is therefore inevitable that they will be swamped by their more numerous and enterprising fellow inhabitants.

The Elections.—The September elections in Cape Colony were disappointing to the sanguine hopes of Mr. Cecil Rhodes and the Progressive party. The vote resulted in the election to the lower house of forty members representing the Africander Bond and thirty-seven Progressives; Mr. Rhodes himself, however, was elected for two districts, Namaqua and Barkly West, of which he chose to represent the latter. He was bitter in his accusations that, in order to win the election, the Bond used money from the Transvaal; and he said that Africander victory would only afford President Kruger better opportunity of gaining control over South Africa. Mr. Rhodes had hoped not only that he would receive an election,

but that the Progressive party would attain a majority in the legislature, by the aid of which he expected greatly to advance his schemes of colonial expansion. The victory of the Bond carried with it no threat or new and definitely outlined policy. Many of the Dutch, though of course a minority, did not vote with it. The result of the election may be regarded as a rebuke to Mr. Rhodes himself. In England while popular sentiment was with the Progressives, the victory of the Bond was looked upon by many as a blessing in disguise, for though it was quite certain that the Africanders would maintain the onerous duties on food stuffs, it was thought that this evil would be counterbalanced by the closer and more friendly relations which would arise between the Cape and the Transvaal. The influence and power of Mr. Schreiner and Mr. Hofmeyr at Cape Town, together with their close and friendly relations with Mr. Reitz, the Secretary of State at Pretoria, would be sufficient, it was thought, to keep the two states at peace. The result of the election, moreover, was not so disastrous to Mr. Rhodes, as it first seemed. For he could now give more time to the development of Rhodesia and even to the extension of British authority far to the northward; for it is clearly his design that British authority extend straight through the continent of Africa from Cape Colony to Egypt. (See "CAPE TO CAIRO" RAILWAY SCHEME and AFRICA.) It is believed that he has long been in coöperation with the British Foreign Office and with British officials in Egypt. In September, shortly after Sir Herbert Kitchener's victory at Omdurman, gunboats sailed up the White Nile to meet Major MacDonald coming northward with a force from Uganda. It was said at the time that there "is little doubt that Mr. Rhodes is behind this movement, and that his schemes for British control in Africa will not be materially affected by the result in Cape Colony."

"CAPE TO CAIRO" RAILWAY SCHEME, a project for opening a line of communication under British control from one end of the African continent to the other. As set forth by Mr. Rhodes the plan seemed feasible. At the close of the year 1898 about 600 miles of railway had already been constructed extending from Vryburg in Bechuanaland to Buluwayo. The new line would begin at that point and extend northeast for about 100 miles and then due north following for the most part the 31st degree of longitude and crossing the Zambesi river at a distance of about 500 miles from its mouth. In general the course would lie between 500 and 800 miles from the coast. The total length of line when completed was estimated at about 1,750 miles. Among the great advantages which would result from it the following are mentioned: In passing from Buluwayo to the Zambesi it would traverse the gold country and open communication with the mines, tap a valuable coal district and open up a very fertile and thickly populated region to trade. On the northern side of the Zambesi river it was estimated that the railway would rise gradually to a height of about 6,000 feet but the grading would not be difficult. Here too productive and populous regions would be opened up to trade. It was also urged that the railway would equalize the rates of labor, which vary greatly at the different mining centres. Steamship service would afford communication between the southern and northern ends of Lake Tanganyika and from the northern end of that lake the project contemplates the continuance of the railway to a point in Uganda (q.v.), probably connecting there with the Uganda railway. As to the cost, it was estimated that to carry the line as far as the southern end of Lake Tanganyika would cost about £5,000,000.

CAPE VERDE ISLANDS are a group containing fourteen islands belonging to Portugal, and lying about 320 miles west of the cape from which they take their name. They have an area of from 1,480 to 1,650 square miles with a population estimated at 114,130, although some estimates place it as high as 120,000. The inhabitants are a mixed race who have descended from the Portuguese settlers and the negroes brought in from Africa. The negro element predominates, but the language spoken is a corrupted form of Portuguese. The chief products are sugar, cotton, coffee, tobacco, indigo, millet and medicinal products. The revenue for 1896-97 was estimated at 267,500 milreis and the expenditure at 277,080 milreis, the milreis being valued in United States gold at \$1.08. The islands are under a governor whose residence is at Praia, the capital.

CAPRON, ALLYN, captain of "Capron's battery," First United States Artillery, which took part in the battle of El Caney before Santiago, July 1, 1898, died near Fort Myer, Virginia, September 18, 1898, of typhoid fever contracted in Cuba. He was born in Florida. Captain Capron's father was killed at Churubusco, and his son, Captain Allyn K., in the fight at Las Guasimas, June 24, 1898.

CARBON DI-OXIDE. Dr. A. Fisher has described the methods by which carbon di-oxide can be collected from air and can be liquefied and put on the market in a practical manner. He computes that as many as 100,000,000 pounds of liquid carbon di-oxide, produced in the manufacture of beer, is going to waste each year.

The gas obtained from this source has the agreeable ethereal odors of the various fruit ethers which can be removed by washing.

CARBORUNDUM. During the past year the output of carborundum has increased markedly, and the compound is rapidly displacing all other abrasives in this country and in Europe. Carborundum is manufactured out of a compound of coke, white sand, salt and sawdust, measured and mixed in proper proportions. This material is subjected to an enormous voltage of electricity after being packed in furnaces. Rough, oblong boxes of brick, constructed without any mortar or cement, constitute the furnaces, each one measuring about fifteen feet in length by seven feet in width and seven feet in height. In the centre of each furnace is a large bronze plate which is connected by means of four large copper cables to massive copper bars extending under the floor at either end of the furnace. Connecting with the inner surface of the bronze plates are 120 carbon rods, 60 to each plate. These rods are 3 inches in diameter and a little over two feet in length, and are so placed as to pass through the end walls of the brick furnace, projecting into the interior and toward each other, constituting the terminals. About ten tons of the mixture described constitute a charge for each furnace, and is heaped smoothly about a core of granules of crushed coke about 21 inches in diameter and 9 feet long, extending through the mass so as to connect the ends of the carbon rods, thus completing an electrical connection through the furnace from bronze plate to bronze plate. Into this granular core or cylinder 1,000 horse power of electric current is turned, and kept flowing for twenty-four hours consecutively. About two hours after turning on the current, gases begin to escape through the crevices of the walls of the furnace, which ignite and burn with a blue flame. In twelve hours the entire mass of the compound becomes red hot. At the end of twenty-four hours the current is stopped. Upon removal of an end wall of the furnace the granular core is found to consist of pure carbon, all its impurities having been volatilized at an expense of one-quarter of its weight. Grains of graphite are found disseminated through its mass, from which it is inferred that its temperature has reached 7,000° during the passage of the current, the point of graphite formation. Surrounding the core is found a purplish crystalline formation, the crystals being constructed on lines radiating from its centre. As the distance from the core increases, the crystals decrease in size, until, at about fifteen inches from the core all crystallization ceases, and the material appears amorphous. This amorphous material is of a pale gray color for about two inches, then suddenly the color changes to black, this being the mass of the original mixture, cemented together by fusion of the salt. The crystalline and amorphous material is carbide of silicon, or carborundum, as it was named by its inventor, E. G. Acheson. About two tons of carborundum are produced in each furnace run, from ten tons of the mixture. After being taken out of the furnace it is crushed between iron rollers, to separate the crystals, and then freed of all solubles by being treated with an acid and water bath. It is then dried and sifted, to separate the various sized grains. The only factory for the production of carborundum is at Niagara Falls, N. Y., whither the industry was removed from Monongahela, Pa., in 1895. The electric current is supplied to the carborundum company by the Niagara Falls Power Company. Carborundum is used for dental and manufacturing jewelers' fine tool grinding, pearl grinding, polishing wheels, springs and other parts of watches, glass grinding and finishing, car-wheel grinding and general machine shop finishing. In the form of discs, hones, lathe wheels, engine wheels and cloth finishing it competes easily with emery, garnet and flint cloth. Its inventor, Mr. Acheson, has perfected a process for making electric light carbons out of 1 part of carborundum and 9 parts of pure carbon, reduced to a powder and combined with tar, moulded and baked. An ordinary cored carbon point may be used, and the core filled with carborundum either alone or mixed with a binding agent. For the filaments of incandescent lamps the carborundum in a very fine powder is mixed with and suspended in the oil used in the oil bath for the treatment of the building of the carbons. In the process of deposition, fine particles of carborundum become fixed to the filament simultaneously with the deposit of carbon. As carborundum is formed at a temperature approximately that of the electric arc, it is free from all volatile matters and acts unchanged as the light-giving body. It resists oxidation to a greater extent than any other known material even when heated highly and exposed to a stream of oxygen. It produces a greater quantity of light for the electrical energy consumed than any illuminating body heretofore used.

CARDINAL, the dignitary of the Roman Catholic Church ranking next to the Pope. The body of Cardinals constitute the sacred college and are the Pope's council and electors. There are three orders: Cardinal Bishops; Cardinal Priests; and Cardinal Deacons. From their list the new Pope is always chosen. The Cardinals at the end of 1898 were with their dates of creation:

Cardinal Bishops: C. Mazzella (1886); Mario Mocenni (1893); L. M. Parocchi

(1882); L. O. S. Stefano (1873); S. Vannutelli (1887); and Isidore Yerg (1884). Cardinal Priests: A. Agliardi (1896); A. Bausa (1887); A. Capecelatro (1885); A. M. Casajares (1895); S. Cassanas (1895); P. G. M. Celesia (1884); L. Conille (1897); S. Cretoni (1896); L. Di Canossa (1877); Angelo Di Pietro (1893); A. A. Ferrari (1894); D. Firrata (1896); A. Ferreira (1879); S. Galeati (1890); James Gibbons (1886); P. L. Goosens (1889); G. M. Gotti (1895); J. Haller (1895); I. Herrera (1897); D. M. Jacobini (1896); Philip Krementz (1893); George Kopp (1893); E. Laboure (1897); B. M. Langenieux (1886); V. Lecot (1893); M. Ledochowski (1872); Michael Logue (1893); A. Manara (1895); P. F. Moran (1885); J. S. Neto (1884); M. Rampolla (1887); F. M. Richard (1889); C. M. Sancha (1894); Joseph Sarto (1893); Francis Satolli (1895); L. Schlauch (1893); F. de Paul Schonborn (1889); P. Sourrieu (1897); D. Svampa (1894); V. Vannutelli (1890); Herbert Vaughan (1893); and Claudius Vaszary (1893). Cardinal Deacons: L. Macchi (1889); T. Mertel (1858); R. Pierotti (1896); G. Prisco (1896); F. Segna (1894); and A. Steinhuber (1895).

CABEY ACT. See IRRIGATION.

CARLINGFORD, First Baron (1874), **CHICHESTER SAMUEL PARKINSON FORESCUE**, P. C., K. P., was born at Glyde Farm, County Louth, Ireland, January 18, 1823, and died January 30, 1898. He was educated under private tutors and at Christ Church, Oxford. From 1847 to 1874 he was Member of Parliament for County Louth. He was Lord of the Treasury (1854-55); Under Secretary of State for the Colonies (1857-58 and 1859-65); Chief Secretary for Ireland (1865-66 and 1868-71), having a seat in the cabinet; President of the Board of Trade (1871-74); Lord Privy Seal (1881-85); Lord President of Council (1883-85); Lord Lieutenant Essex (1873-92). Up to 1886 Lord Carlingford was a Liberal, but after that date a Liberal Unionist.

CARNEGIE MUSEUM. See ANTHROPOLOGY.

CAROLINE ISLANDS, are a widely scattered archipelago in the Pacific Ocean north of New Guinea and east of the Philippines. They have an area of about 500 square miles with a population estimated at 36,000 and consist of 36 minor groups of islands, the principal ones being the Pelews or Palaos, Yap, Uluthi, Uleai, Namonuito, Ruk or Hugoleu, the Mortlocks, Ponapé or Bonabe, and Kusaie, sometimes known as Ulan or Strong's Island. They belong to Spain, being in that general island system which is called Spanish Micronesia. The war between United States and Spain in 1898 drew public attention to these islands along with the other colonial possessions of Spain and the United States Consular Report for September 1898 publishes an interesting account of the various groups by Mr. F. W. Christian, a well-known explorer in the Central Pacific.

In the Pelew group there are some 200 islands of which the chief one is Bab-el-Thaob, whose area is equal to that of all the others put together. The population of this group, estimated at some 3,000, speaks a Malayan dialect. The chief products are turtle shell, copra and *bêche de mer*. Fruits, especially yams, bread fruit, and cocoanuts, are grown in large quantities and there is excellent pasturage for horses and cattle. A curious form of money has existed in the islands, consisting of enormous discs of quartz which was quarried in one of the smaller islands. Yap, which gives its name to another group of islands, lies about 300 miles to the northeast of the Pelew group. It is surrounded by a coral reef. Inland there are wide stretches of swamp land, but few streams. Signs of an ancient civilization are present here, including terraces, stone-paved roads, and the walls of fish ponds in the lagoons. The natives who number some 8,000 are generally regarded as a peaceable and industrious folk. They speak a language similar to that spoken in the Pelews. The soil produces sweet potatoes, yams, pawpaws, taro, pineapples, sugar cane, bananas, and other fruits. Copra is an important article of export, the trade being chiefly in the hands of the Germans. There is a European settlement at Tomil Harbor which is the seat of the Spanish Governor for the Western Carolines. A small Spanish garrison is maintained on the islands and political prisoners taken in the course of the war in the Philippines were there held in custody.

The Uluthi or Mackenzie group, lies a short distance to the north of Yap. Its chief port and trading place is Arrowroot or Mokomok. The natives pay tribute to Yap and are in general of an industrious and law-abiding character. The Uleai group is not extensive, having a population of about 800. Its trading depot is Raur. The language is Malayan and the people are in part descendants from the ancient inhabitants of the Mariannes who fled from their homes when those islands were taken by Spain in the sixteenth century. The Hall group or Namonuito and the group of small islands to the south have a bad name on account of the acts of violence committed by the natives. Piracy has been practiced and has for the most part gone unpunished. Ruk or T'Ruk, so called from the name of the highest island in the group, lies to the eastward and consists of about seventy islands. Here,

too, copra is one of the chief products and turtle shell, *bêche de mer* and pearl shell are obtained in large quantities. An extensive trade is carried on with the Japanese and the Germans. Of late the natives have shown a turbulent temper and civil war has raged. The local government of the islands is in the hands of small chieftains or rajahs. The Mortlocks are inhabited by a race which shows a larger Polynesian admixture than in most of the islands. The inhabitants, like those of Ruk have the custom of cutting the lobe of the ear and forcing it to grow downward until it forms a long flap, giving them an extraordinary appearance. In some parts of this group piracy and acts of violence have been frequent of late. The products are for the most part the same as in the other islands and the trade is largely in the hands of the Germans.

One of the most important islands of the eastern groups is Ponapé with an area of 170,324 square miles. The natives are ruled by petty chieftains under the general direction of the Spanish governor. They are divided into several tribes. There is a small Spanish colony at Santiago on Asuncion bay. Near the island of Tomun there is a long artificial breakwater enclosing about fifty walled islands separated from each other by narrow canals. Interesting relics have been found on some of these islands showing the condition of civilization in the past particularly on the walled island of Nan-Tauch, which is regarded by the natives with superstitious reverence. The chief products of Ponapé are copra, turtle shell and ivory nuts. Of the trees found on the island may be mentioned the och, a variety of palm, the ais whose fruit is used in the making of varnish, and besides these there are in the interior forests fairly rich in timber and in wood for cabinet work. Pigs and a tailless variety of dog much esteemed by the natives as food, are found on the islands. A great variety of fruits are grown, the bread fruit being especially abundant. Mokil contains three low islands and a population of about 200. They speak the Ponapéan dialect. The Christian religion has been introduced and there is a strict prohibition of the use of intoxicating liquors and tobacco. Pingelap, lying some sixty miles to the south of the Mokil group consists also of three low coral islands lying close together, and has a population of about 1,000.

When the members of the Paris Commission had agreed upon the terms of peace between the United States and Spain, the representatives of the former power tried to induce Spain to cede one of the islands to the United States and to grant religious freedom to the entire group. These requests were refused.

CARTHAGE. See ARCHÆOLOGY (paragraph France).

CARTWRIGHT, Sir RICHARD, G. C. M. G., Canadian minister of trade and commerce, and member of the Anglo-American Joint High Commission, created in May 1898, by the British and American governments, was born at Kingston, Ontario, December 4, 1835. He was educated at Trinity College, Dublin, entered the banking business and became president of the Commercial Bank of Canada. In 1863-67 he was member of the Canadian Parliament for Lennox and Addington and, in 1867-68, after the confederation of the provinces, was member for Lennox. He then represented Centre Huron and subsequently South Huron, and since 1887 has been returned for South Oxford. At one time he was an independent supporter of Sir John A. MacDonald; but, after the "Pacific scandal," he came over to the Reform party. From 1873 to 1878 he was Minister of Finance in the Mackenzie cabinet; after the Conservatives came again into power, he was recognized as leader of his party in questions of finance. In 1897 he became a K. C. M. G., and in 1897, at the time of the Queen's Jubilee, was advanced to G. C. M. G. In 1896 he became Minister of Trade and Commerce in the Laurier cabinet.

CASIMIR-PERIER, JEAN PAUL PIERRE, former President of the French Republic (1894-5), born in Paris in 1847. He was a witness in the Zola case. (See FRANCE, paragraphs on History.) Many stories were told in regard to his sudden resignation of the presidency in 1895, connecting that resignation with the Dreyfus affair. According to one of these stories, he resigned on receiving a letter from Emperor William, of Germany, declaring the writer's belief in the innocence of Dreyfus, and naming the real culprit. According to another, the German ambassador, Count von Munster, sent a detailed report of the Dreyfus case to the German count in December, 1894, and that report was intercepted and photographed by the French authorities before it reached its destination. Count von Munster complained of this indignity, and demanded his passports. The President, in great distress, smoothed the matter over, but the same thing happened a second time. On this occasion the danger to the friendship of the two countries seemed so serious that the President found the only way of preventing disaster was his resignation. What basis these stories may have cannot be ascertained, but they are significant as showing the excited state of public opinion, and the sensational rumors that were set afloat. Casimir-Perier's appearance in the Zola trial was encouraging to the defence, for he seemed willing to offer his testimony, but the court ruled out most of the questions asked by the defence.

CATHODE RAYS. See BOTANY (paragraph Plant Physiology); and PHYSICS (paragraph Roentgen Rays).

CATHOLIC BENEVOLENT LEAGUE, a denominational fraternal insurance order, religious, social, and benevolent, founded in 1881. It consists of seven State councils; 667 subordinate councils; and 48,000 members. Since its organization \$9,045,542 benefits have been distributed, and during the last fiscal year \$1,081,407 was disbursed. Total membership 48,000. Officers, Rt. Rev. Charles E. McDonnell, Spiritual Advisor; John C. McGuire, Brooklyn, President; Alfred V. Harding, New Brunswick, N. J., Vice-President; John D. Carroll, Brooklyn, Secretary; and John D. Kieley, New York, Treasurer.

CATHOLIC KNIGHTS OF AMERICA, founded in 1877. It has one supreme council, 581 subordinate councils, 24,000 members. Rt. Rev. John M. Farley, New York, Spiritual Director; Edward Feeney, Brooklyn, Supreme President; C. S. Ott, Galveston, Texas, Supreme Vice-President; Joseph C. Carroll, Norfolk, Va., Supreme Secretary; and Gerard Rieter, Vincennes, Ind., Supreme Treasurer. Since its organization \$8,329,383 benefits have been disbursed and, \$710,208 in the last fiscal year.

CATHOLIC MUTUAL BENEFIT ASSOCIATION, founded in 1876, has a supreme council, six grand councils, 600 branches, and 43,000 members. Benefits disbursed since its organization amounted to \$7,000,000, during the last fiscal year, \$750,000. President, Michael Brennan, Detroit, Mich.; Vice-President, John M. Molamphy, Pittsburgh, Pa.; Recorder, C. J. Hickey, Brooklyn; and Treasurer, James M. Welsh, Hornellsville, N. Y.

CATTELL, REV. WILLIAM C., D. D., ex-president of Lafayette College, Easton, Pennsylvania, died in Philadelphia, February 11, 1898. He was born at Salem, New Jersey, 1827; graduated at Princeton, for five years was professor of Latin and Greek at Lafayette, and for three years was pastor of the Pine Street Presbyterian church in Harrisburg, Pennsylvania. He was President of Lafayette from 1863 to 1883; and it is said that through his exertions more than a million dollars was obtained for this college. After his retirement from the presidency he was chiefly engaged in work for the societies of the Presbyterian church, especially for the Board of Relief for disabled ministers, of which he was corresponding secretary.

CAUCASUS is the name of the mountain range between the Black Sea and the Caspian which now forms the boundary line between Europe and Asia. It is also the name of a Russian lieutenancy, lying on both sides of the mountain range, and having an area of 180,843 and a population in 1893 of 9,723,953. The census of 1897 showed that in Caucasus, as in most frontier communities, there was a larger proportion of males than of females, the ratio being 89.5 women for every 100 men. As to the ethnic composition of the population, it exhibits a very remarkable variety, including as the largest elements numerically the Russians (1,915,614), the Tartars (1,027,828) and the Armenians (803,696). But besides these there are Turks, Northern Tartars, Turcomans, Ossets, Persians, Georgians, Imeretes and a variety of other tribes. A large part of the mountain population lead a half savage life subsisting mainly by the chase. Education has made some progress among them in recent years, but according to the figures for the years 1891-94 a small number of children were in the schools in proportion to the total population, although the primary schools numbered 4,236 with an attendance of 143,786.

CAVAIGNAC, JACQUES MARIE EUGENE GODEFROY, former Minister of War in the Brisson cabinet, and prominent in 1898 in connection with the Dreyfus case (see FRANCE, paragraphs on History), was born in Paris May 21, 1853; served as a volunteer in the Franco-German War; was Minister of Marine in the Loubet cabinet in 1892, Minister of War in the Bourgeois cabinet in 1895-6; and Minister of War in the Brisson cabinet in 1898. He was a strong advocate of revision under the Méline ministry, but after a continued study of the case came to the conclusion that Dreyfus was guilty. It was his speech in the Chamber of Deputies in regard to the three documents which he considered conclusive proof of the guilt of Dreyfus, that created such a sensation, and by the government's order was placarded in all the communes of France. When he found that the main ground of his belief was destroyed by Lieutenant Colonel Henry's confession and death, he handed in his resignation, for he still maintained that Dreyfus was guilty. He said he had other proof of guilt than that which he had advanced. It will be remembered that the supplementary proof which he urged in his speech, viz., the alleged confession to Lebrun-Renaud, was seriously impaired by rebutting testimony. The governor of the prison in which Dreyfus was confined had denied the existence of this alleged confession, and it rested at best on very slender evidence. Nevertheless, Cavaignac said of it that "either human testimony has no longer any value" or Dreyfus had admitted his guilt.

CAVALLOTTI, FELICE CARLO EMANUELE, Italian poet and publicist, was killed in a duel with swords with Signor Macola at Rome, May 6, 1898. He was born at

Milan, November 6, 1842. At an early age he published poems revealing a hatred of Austria and took part in the struggle for independence. In 1871 he published the patriotic drama *I Pezzanti*, which was the first of a number of plays written by him. He wrote *Anticoglio*, a volume of poems political and lyric. Subsequently his writings were collected and published as "*Oeuvres Complètes*." He was a Radical, was repeatedly a member of the Italian parliament, and always an opponent of Signor Crispi. The duel resulted from a newspaper controversy between him and Signor Macola, he being editor of the Milan *Seculo* and Macola of the *Gazzetta Di Venezia*.

CELEBES is a large island in the Eastern Archipelago of the Pacific Ocean lying east of Borneo and having an area of 71,470 square miles, with an estimated population at the end of 1895 of 1,997,860. For administrative purposes it is divided into two residencies in accordance with the Dutch system for the administration of the colonies. The whole of the island is practically under the control of the Dutch, but only a small portion of it is under their direct administration, many of the petty princes being permitted to manage local affairs. The part directly under Dutch administration contains the towns of Menado, Port Rotterdam, and Vlaardingen or Macassar.

CELL (VEGETABLEQ. See BOTANY (paragraphs Cytology, Histology and Morphology, and Plant Physiology).

CEMENT. *Portland Cement.*—The production in 1897 amounted to 2,677,775 barrels, valued at \$4,315,891, which was an increase of nearly 74 per cent. over 1896. This was supplied by twelve States, but most of it came from the Lehigh Valley region in Pennsylvania. There are now 29 factories in the United States, but their output in 1896 supplied only 34.7 per cent. of our entire consumption, whereas in 1897 it furnished 56.8 per cent. The imports in 1897 were only 2,090,924 barrels, a decrease of 900,000, and these came chiefly from Great Britain, Germany, Belgium and France. The prejudice which once existed against the American product has practically disappeared, and much of it shows decidedly higher tests than the imported article.

Rock Cement.—The output of this material in 1897 was 8,311,688 barrels, valued at \$3,862,392, and was the largest production known, notwithstanding the fact that rock cement has been superseded to a large extent by Portland cement.

CENSUS OF THE UNITED STATES. On December 27, 1898, an important report relating to the scope and method of the Twelfth Census was presented to the American Economic Association at its eleventh annual meeting in New Haven, by a committee of the association consisting of Prof. R. Mayo Smith of Columbia University, Prof. W. F. Wilcox of Cornell University, Prof. R. P. Falkner of the University of Pennsylvania, Prof. D. R. Dewey of the Mass. Institute of Technology and Hon. C. D. Wright, U. S. Commissioner of Labor. The report contained a number of recommendations for the work of future censuses, and these were quite fully discussed by various members of the association. Naturally the report contained criticisms of certain features of the eleventh census, relating not so much to the accuracy of the census returns as to the methods of treating the data. It called attention to the fact that insufficient time was allowed by law for preparing plans and schedules, and work was required of the census authorities which should have been transferred to established departments or bureaus which were familiar with the subject matter and possessed a trained force for conducting investigations. By multiplying the lines of inquiry to be pursued in the census the work was seriously impeded. Among the defects pointed out by the committee were: (1) The irregularity in the system resulting in the grouping of occupations under different heads from census to census, making comparison difficult or impossible. (2) "Lack of co-ordination," resulting in different methods of presenting the subject, so that certain classes of facts investigated in some cases were omitted in others. (3) "Faults of method." As instances of these were cited the attempts to "obtain the annual rates of crimes, births, and deaths by direct enumeration at a given time without recourse to registration or other continuous records," the asking of questions that are not likely to be correctly answered, such as the degree of intermixture of white and negro blood; defective tabulations of material; defective classification, etc.

In the discussion that followed it was asked if it were possible to obtain statistics of capital and industry. It was pointed out that the weakest portion of the census returns related to statistics of manufactures, a matter which is involved in the greatest difficulty owing to the inadequate and defective nature of the statistics and their liability to be misunderstood. "Such is their construction," said the author of a paper on this subject, "that in a series of problems which increasingly occupy public attention—those which have to do with either the relations of labor and capital or the contention of individualism versus collectivism—either side can

prove from them, or thinks it can prove, practically any proposition it chooses to advance." He added, however, that the prospect of improving this class of statistics was not altogether hopeless, saying "that two things may encourage us in spite of this outlook; one is the fact that defective as they are, our manufacturing statistics are the best produced in any country; the other that since 1860 they have steadily improved from decade to decade." One of the great difficulties of course in the returns obtained in this line of investigation has been the lack of a unit of measurement on account of the fluctuation in the value of the medium of exchange. The writer just quoted pointed out that "there have been no two censuses at which the dollar represented the same quantity of goods or in the matter of wages the same purchasing power." Further difficulties are that of determining what constitutes manufacturing and that of deciding upon methods and phraseology which shall be uniform throughout investigations.

CENTRAL AMERICA. The territory of Central America nearly equals that of France, while the population is less than that of Belgium, but the agricultural conditions are so promising that it is said that the area which now supports about three million people could readily accommodate ten times that number. The country seems to enjoy the advantages not only of a most excellent geographical position, rich soil, extensive coast lines, and great mineral wealth, but a climate that is both agreeable and healthful. The fact that the land rises from the sea to points 11,000 feet above the sea level, explains how products of the tropical, sub-tropical, and temperate zones can all be raised with advantage. Those who are interested in Central America maintain that a brilliant future awaits her, and this will probably prove to be true unless the industrial conditions are spoiled by the political characteristics of the people, who thus far, it must be said, have shown no great success in maintaining a stable democratic government.

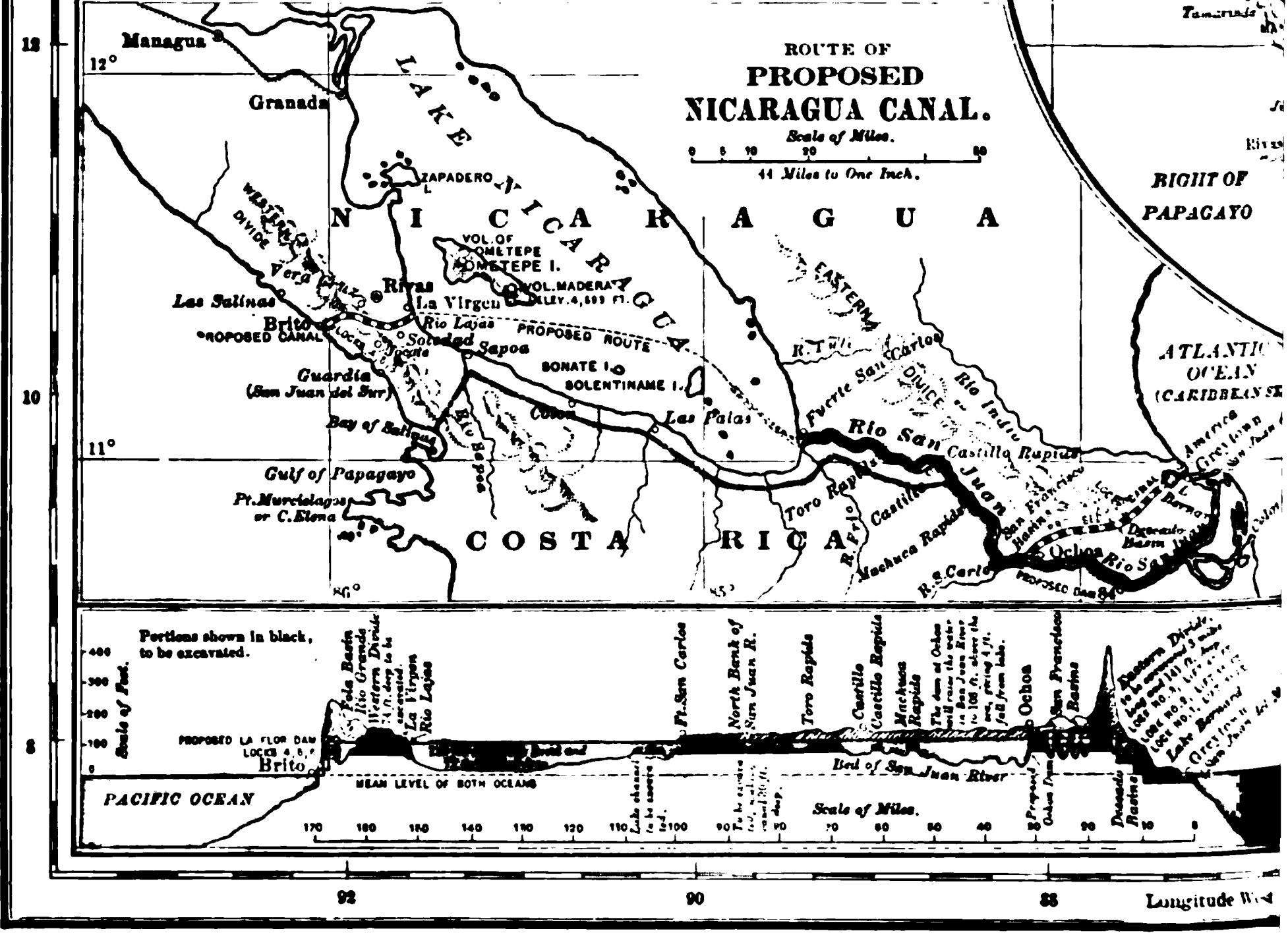
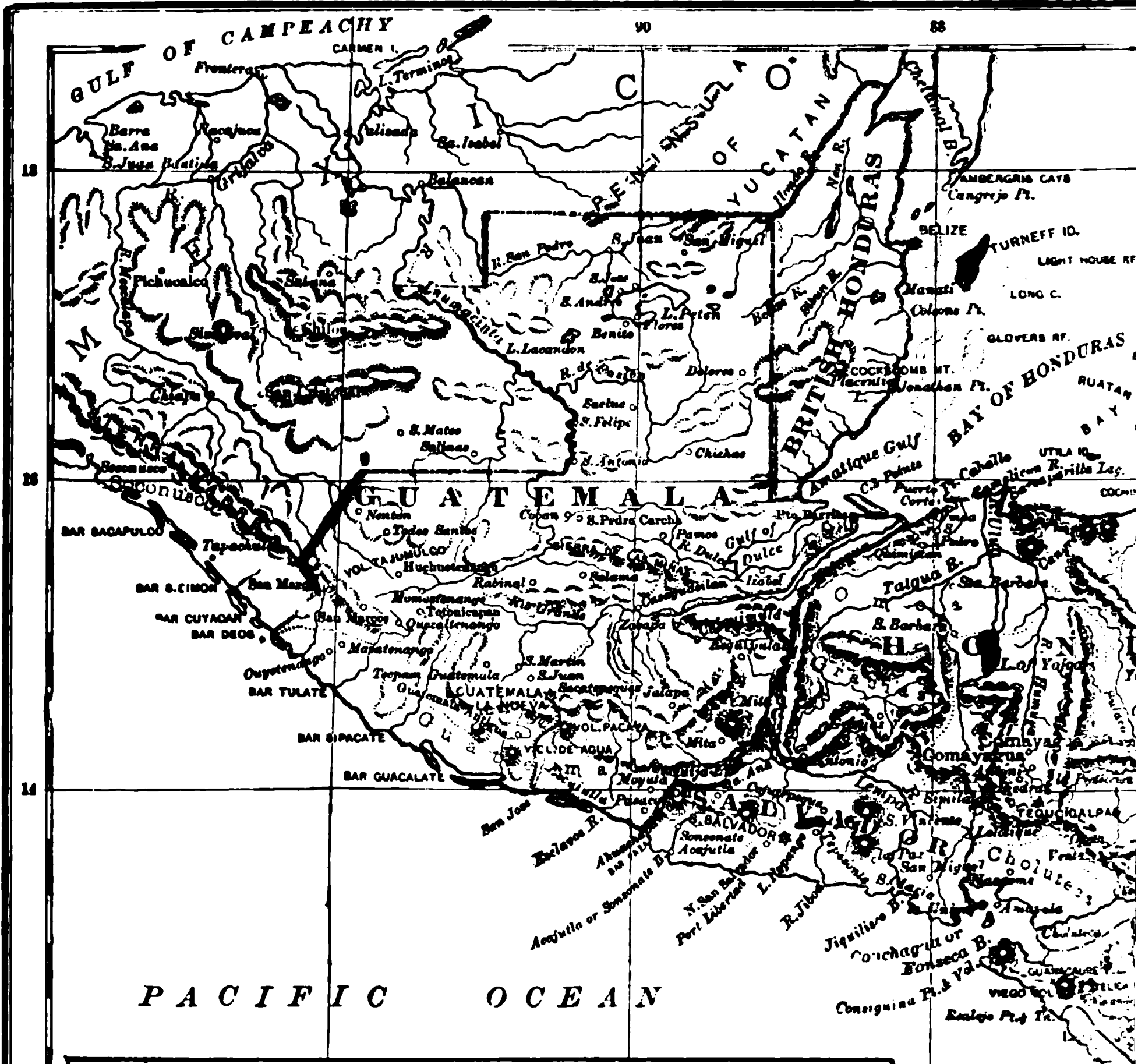
Railway Development.—The commercial importance of the country has been increased by the construction of railroads and will be further improved when those now building are completed. The principal railroads in Central America in 1898 were as follows: In Guatemala—the Southern Railroad, seventy-five miles in length, traversing Escuintla, connects the Pacific port of San José with the capital, Guatemala City; the Western Railroad, forty-one miles in length connects the port of Champerico with San Felipe; there is a branch of the Southern Railroad from Escuintla to Patulul and a road from Iztapa to Naranjo, and a section of 125 miles of the Northern Railroad between Puerto Barrios to Rancho de San Agustín. In Honduras there is a road between Puerto Cortés and San Pedro Sula. In Salvador a road connects the port of Acajutla with Santa Ana; Armenia has railway communication with Ceiba, and Santa Tecla with San Salvador, the capital. Nicaragua has what is said to be an excellent railroad, divided into two sections. The first, fifty-eight miles in length, connects Corinto with Momotombo on Lake Managua; the second section covers a distance of thirty-three miles, connecting Granada to Managua, the capital. Small steamers connect this place with Momotombo. In Costa Rica there were in 1898 two railroads in operation; the one, 117 miles in length, extends from Port Limón through the capital San José to Alajuela; the other, fourteen and one-half miles long, unites Esparta with the Pacific port Puntarenas. The more important lines in process of construction in 1898 were as follows: In Guatemala the Northern Railway, between Guatemala City and Puerto Barrios on the Atlantic was almost completed. The assassination of President Barrios delayed work on this road, but in April 135 miles had been finished and put in operation, sixty miles remaining unbuilt. Early in the year in Salvador a road 124 miles long connecting the port of Unión with the capital was almost completed, while work had been begun on a section between Ceiba and Santa Tecla. In Nicaragua the road between Masaya and Jinotepe was finished and opened for traffic in the latter part of the year. In Costa Rica work was begun on a line connecting the Caribbean with the Pacific coast. It is expected that these roads and others which will probably be constructed, connecting the rich interior districts of the several republics, will stimulate agriculture and commerce and will be a large factor in bringing about the permanent prosperity of the country.

Production and trade.—The same kinds of produce are raised in each of the Central American Republics, but some excel others in the cultivation of particular products. The principal products are coffee, all tropical fruits, but especially the banana, and sugar, cacao, indigo, corn, tobacco, hides, lumber, dyewoods, and rubber. Though coffee is the chief product throughout the country it is especially important in Guatemala and Costa Rica. In 1892 the yield in Guatemala was 36,999,464 pounds, and in Costa Rica the annual exports of coffee aggregate nearly 40,000,000 pounds. In Honduras the coffee produced is excellent but of limited quantity. The yield for 1898 in Nicaragua was estimated at 4,000,000 pounds. The industry is growing in this republic, American companies and individuals having invested as early as 1897

a total of \$560,000 (gold) in coffee culture. The coffee exported to the United States in 1897 was valued in gold as follows: from Guatemala \$1,862,589, from Honduras \$847,230, from Salvador \$1,112,534, from Nicaragua \$1,262,701, from Costa Rica \$3,439,374. Excellent cacao is produced in all the republics, especially in Guatemala, but little is exported. Cattle raising, especially in Honduras, is an important industry; it should be said, however, that both the cattle and the horses of Central America are undersized, as a result, it is believed, of "in-breeding." The country is well known for its tobacco and its immense exports of bananas. This fruit, which is easily cultivated yields large returns, and it is said that there are steamship lines which do little else but transport the Central American banana crop to the United States. As yet there are few extensive mining enterprises in the country, but it is known that all the states are rich in minerals, coal and ores of gold, silver, quick-silver, copper, lead, and iron being very common. Recently much more attention has been paid to mining, and Honduras seems to be the richest in mineral wealth. Formerly Central American trade was almost entirely with Europe, but is now being directed more and more to the United States. American imports into Central America during the fiscal year 1896-97 were as follows: to Guatemala \$2,992,118; to Honduras \$669,682; to Salvador \$1,596,861; to Nicaragua \$1,038,664; to Costa Rica \$1,292,709.

The Federation Movement.—It will be remembered that in 1895 the republics of Honduras, Salvador and Nicaragua combined to form the "Greater Republic of Central America" for the purpose of facilitating foreign relations, preventing disputes among the sister republics and providing for the common defense. The treaty establishing this union provided that if the republics of Guatemala and Costa Rica should accept the agreement all should constitute a new federal State. On June 15th, 1897, these two States formed a treaty with the Greater Republic of Central America for the establishment of a federal union of all the States of Central America under the name of the Republic of Central America, each signatory retaining its autonomy in internal administration. No government was formed under the terms of this treaty, and the nearest approach to federal union was still represented by the Greater Republic of Central America. The Constitution of this body provided for the establishment of a diet composed of members elected by the legislatures of the republics. It was stated in the Constitution that the attributes of this diet should have for their principal object the maintenance of harmony with other nations. In general, the Constitution provided merely for a union in respect to foreign affairs. It did not constitute a true national union, and it was not regarded by the State Department of the United States as creating a separate government with attributes of sovereignty. It was therefore proposed to adopt a genuine Constitution, and on the recommendation of the diet a general assembly was held for this purpose on June 20, 1898. By August 27th the Constitution of the new republic was ready. By this Constitution, the three States, Nicaragua, Salvador, and Honduras, became the component parts of a federal republic, under the name of the "United States of Central America." The Constitution of the United States was evidently taken as a model. The chief executive authority was vested in a president elected by popular vote for a term of four years. His functions were to correspond in general to those of the president of the United States. The first inauguration under the Constitution was appointed for March 15, 1899. The Constitution was to go into effect on November 1, 1898, and in the interval between that date and the following March the executive power was to be vested in a commission chosen by the general assembly, consisting of three members, one from each of the States of the union. The presidential election was appointed for the first Sunday in December. The legislative power was entrusted to a Congress made up of two houses, like the Congress of the United States, and a federal judiciary was also modeled upon that of the United States. The relation of the chief executive of each of the three States was to be analogous to that between a State Governor in the United States and the government at Washington, and each State was to have a legislature and exercise control over its own local affairs.

This action on the part of the three States caused much comment in the United States, where it was viewed as a hopeful indication that peaceful relations between the States of Central America would prevail in the future. But the new republic was short-lived. It came into existence on November 1st when the president of the diet of the Greater Republic formally surrendered the powers of that body to the commission in which executive authority was vested until the first presidential inauguration. The federal district formed by the cession of a small portion of their property by the three States was to comprise the coast of the gulf of Fonseca, and the capital was to be Amapala. The latter place seemed to be inaccessible, and the capital was removed to a part of the district which had been Nicaraguan territory. Salvador was dissatisfied with this change and for a number of other reasons, including the fact that she would have to bear a large proportion of the expense of the administration, had been lukewarm in her support of the new republic. About the middle of November an electoral campaign in Salvador was going on and, as usual, took the



CENTRAL AMERICA

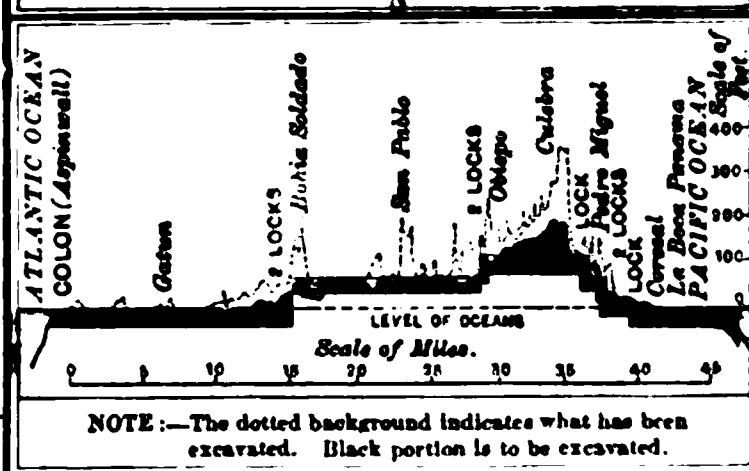
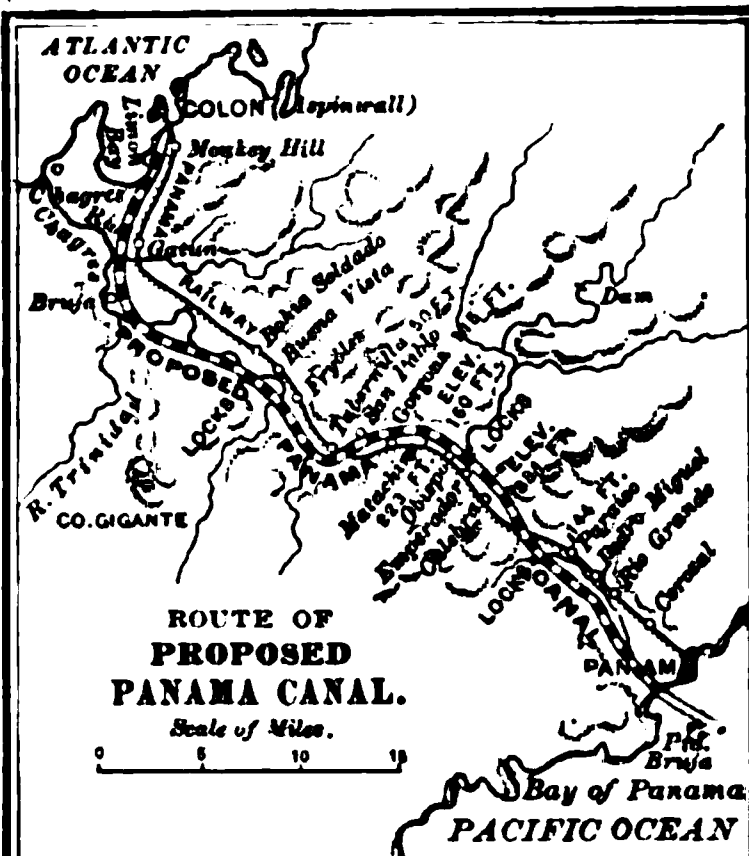
Railways represented thus —

0 10 20 30 40 50 75 100 150

Geographical Miles 60-One Degree

0 10 20 30 40 50 75 100 150

English Miles 60-One Degree



CARIBBEAN SEA

ST. ANDREWS ID.
COURTOWN BK.
ALBUQUERQUE CAY

The level of the Caribbean Sea at Chagres is 6 ft. 6 in. higher than the level of the Pacific Ocean at Panama at low-water.



form of a revolution. As a result of it the revolutionists seized the government. The executive commission of the Federal republic called upon Honduras and Nicaragua to put down the revolt in Salvador. A slight and wholly ineffective military campaign followed and the effort to coerce Salvador was soon given up. On December 1, the Federal commissioners met and decided to dissolve the union. The government of Salvador, while declaring that the Federal republic had been opposed to the vital interests of the Salvadoreans, said it would maintain to the best of its power the friendly relations with the other Central American states, and was ready to combine in a new union as soon as it should be sanctioned by the people.

CENTRAL ASIA. The publication in 1898 of the accounts of explorations in Central Asia by Dr. Sven Hedin and Mr. A. H. Savage Landor drew public attention to the progress of discovery in that region in recent years. This part of the world was, until a short time ago, almost unknown to western peoples. Now the main geographical features of the country have been mapped out through the energy of a large number of explorers, mainly Russian and British. There are still parts of the region, however, which offer fields for further research. The exact character of the mountain ranges in eastern and northeastern Thibet and of the river region running northward from the Indo-Chinese peninsula are little known. In recent years attempts have been made to supply these deficiencies. One of the most remarkable of recent expeditions was that undertaken by the Hon. W. W. Rockhill, the present United States Minister in Greece, who travelled over a vast distance in Eastern Thibet and penetrated to a point not far from the mysterious city of Lhasa, the center of Lamaism, and made a careful study of Thibetan customs and religion. At nearly the same time the country was crossed from north to south by Prince Henry of Orleans and M. Boubalot; and soon afterwards a British officer, Captain Bower, travelled across the Thibetan plateau from west to east. Mr. Little-dale and his wife still more recently travelled through Thibet and came within a short distance of Lhasa, and later still an exploration was made by two British officers, Captain Welby and Lieutenant Malcolm, who traversed the central plateau from west to east by a northerly route.

More interesting, if not more important, than these expeditions was that of the young Swede, Dr. Sven Hedin, who after careful scientific training and a close study of geography both in Sweden and in Germany, made a preliminary expedition to Kashgar in 1889-90. Returning to Sweden and securing financial aid from the king and some private individuals, he again set out for the east in October 1893. He applied himself to the study of that little known region of lofty mountains called the Pamirs, and to the tracing of the tributaries of the Oxus. He made a daring attempt to reach the summit of the highest mountain of the Pamirs, Mustag-ata, which rises 25,000 feet from the plateau. Undeterred by the warning of the Kirghiz, the natives of the district, who had many superstitious notions in regard to the mountain, he started on the ascent in company with a few volunteers. He made three attempts, on the first reaching an altitude of 16,000 feet, and on the second and third 20,000 feet, but the extreme difficulty of breathing in the rarified air and the inability of his companions to climb further led him to give up the undertaking.

After a winter at Kashgar he explored the country between the Kashgar and Yarkand rivers, adding much to the geographical knowledge of those regions. In the spring of 1896 he entered the Takla-Makan desert lying between the Yarkand and Khotan rivers, accompanied by four men. The party suffered the severest hardships, having exhausted their water supply and being obliged to grope their way over an absolutely bare and sandy desert. Water was discovered just in time to save his life and he made his way with two survivors to the town of Khotan. He afterwards crossed the desert again from south to north coming out at the river Tarim, whence he went on to the lake region of Lob-Nor, from which he returned to Khotan. In his journeys across the desert he found many interesting and valuable relics pointing to the existence at one time of flourishing cities and fertile fields in this now barren land. From Khotan he passed through a country which had been for the most part unexplored to the Kuen-Lun mountains, through Tsaidam and Koko-Nor to the Hoang-Ho river, whence he passed on to Peking and journeyed home through Siberia.

The records of his journey are remarkably interesting as well as scientifically valuable. He brought back a great number of photographs and sketches and an abundance of data of geographical and ethnological importance. From geographical societies as well as from the government, he received the highest honors.

The expedition of Mr. A. H. Savage Landor resulted in even more exciting adventures. Mr. Landor is the grandson of Walter Savage Landor the great writer. He has spent a large part of his time in Italy where he owns an estate near Florence. Though slight in build and of delicate appearance, his endurance of hardship was remarkable, long years of training having fitted him for the exhausting work of

an explorer. His first venture was a journey among the "hairy Ainos" of Japan, about whom he afterwards wrote a book. The means for his travels in Thibet were supplied by Mr. Alfred Harmsworth the proprietor of an important London newspaper. Mr. Landor started from England in the spring of 1897. He entered Thibet from northwest India eluding the vigilance of the authorities who guarded the frontier. His object was to reach the forbidden city of Lhasa. Taking his course along a stream which appeared from its general direction to flow toward the Brahmaputra, he made rapid progress at first, but he suddenly found himself in the hands of enemies, and deserted by his friends. He was roughly used and carried toward Lhasa. When within a short distance of the city he was tortured by his captors who racked his limbs and nearly destroyed his eyesight by a red hot iron. This, he said, was by the direction of the high Lama and preparations were made for completing the work by decapitation, but for some reason or other his tormentors changed their minds, and binding him in a spiked saddle astride a pony, started him toward the frontier where he was met by a friendly party. Even in the midst of his extreme sufferings, it is said that Mr. Landor kept constantly in mind the object of his expedition, noting the features of the country and preserving through all his hardships his maps and photographs. The account of his adventures seemed so improbable that in some quarters they were received with incredulity, but geographers of high authority have accepted his statements.

CENTROSOME. See BOTANY (paragraphs Centrosomes and Blepharoplasts, Spermatozoids in Gymnosperms, Cytology).

CERVERA Y TOPETE, PASCUAL DE, Conde de Jerez, Marquis de Santa Ana, the Spanish admiral defeated at Santiago de Cuba, July 3, 1898, was born about sixty-six years ago in the province of Jerez, Spain. His father was a man of great wealth, and his mother, Marie Topete, belonged to a branch of the royal family. Cervera's advancement is said to have been due to these facts, although he is recognized as a man of no mean ability. He was graduated from the naval academy at San Fernando, Spain, in 1851; his first campaign occurred in 1859 when he accompanied the Spanish expedition to Morocco, and rose to the rank of first lieutenant. In 1862 he went with an expedition to Cochin-China; promoted to a captaincy, he commanded a vessel off the Peruvian coast in 1868-70, and was then transferred to blockade duty in Cuban waters, the Ten Years' War having broken out some two years previously. Being later recalled from Cuba, he became Minister of Marine in the Spanish cabinet, and subsequently was put in command of the battleship *Pelayo*, the construction of which had been carried on under his direction. He has been adjutant to the Queen Regent, and several years ago was chairman of the Spanish naval commission sent to London to confer upon naval matters with similar commissions from other powers. Cervera has been recognized as the foremost naval commander of Spain. After the battle of Santiago he was taken to Annapolis, Maryland, and then to Portsmouth, New Hampshire, where most of the Spanish prisoners had been sent. On September 12, 1898, with over 1,700 other Spaniards, he sailed for Spain. On account of his courteous and dignified bearing while in the United States, together with the fact of his terrible defeat, public feeling for Cervera became almost kindly. Whether or not he was compelled by governmental order to leave Santiago harbor it still an open question. For further facts concerning Cervera in 1898, see SPANISH-AMERICAN WAR, (paragraphs Beginning of the War and Destruction of Cervera's Fleet).

CEYLON is a large island and British colony in the Indian ocean to the southeast of the peninsula of Hindoostan, with which it is almost joined by the chain of reefs known as Adam's Bridge. The waters lying between it and Hindoostan are known as the Gulf of Manaar and Palk's Strait. It has an area of 25,365 square miles with a population in 1891 of 3,008,466 of whom 6,068 were English, 21,231 Eurasians, that is descendants of Europeans, while the most numerous element of the natives were the Singhalese numbering over 2,000,000. Other tribes are the Tamil immigrants and settlers numbering 723,853, the Moormen numbering 216,156, and Malays, Veddahs and other races. A considerable part of the land is under cultivation and produces rice and other grains, coffee, tea, cocoanuts, cinnamon, tobacco, cinchona, etc. Among minerals plumbago is important. Pearl-diving was formerly a very productive industry yielding in 1891, 960,000 rupees, but since that date it has been of no importance. The chief exports are coffee, tea, plumbago, cocoanut products, areca nuts, and cinchona. In 1896 the revenue was 21,974,573 rupees and the expenditure 21,237,860 rupees. The chief items of revenue are the customs, licenses, sale of government timber and salt, stamps, receipts from the government railway, etc. The government is administered by a governor and an executive council of five members, and the legislative power is vested in a legislative council of seventeen members. In 1895 the Right Hon. Sir Joseph West Ridgeway was appointed governor. The majority of the inhabitants are Buddhists, which is the faith of the Singhalese. The Hindoos are next to them in point of numbers and then come

Christians and Mohammedans. Plans have been in progress for adjoining the mainland with the railway system of the island and the subject was discussed in 1897. The new line would be constructed on Adams' Bridge.

CHAGOS ISLANDS. See MAURITIUS.

CHALMERS, GENERAL JAMES RONALDS, politician and Confederate veteran, died at Memphis, Tennessee, April 9, 1898. He was born in Halifax county, Virginia, January 11, 1831; was graduated with the class of '51 at the College of South Carolina and in 1853 was admitted to the bar. The year previous he was a delegate to the Democratic national convention which nominated Franklin Pierce for President. In April 1861 he was elected colonel of the Ninth Mississippi Regiment and early in 1862 became a brigadier-general. He was engaged in almost every battle of the Army of the Tennessee, made six assaults at Shiloh, and was severely wounded at Murfreesboro. It has been alleged that he and General N. B. Forrest were responsible for the massacre of Union troops at Fort Pillow, March 26, 1864. He was a member of the Mississippi Senate in 1876-77. General Chalmers was a Democratic member of the XLIVth and XLVth Congresses, was deprived of his seat in the XLVIIth, and of his certificate of election to the XLVIIIth.

CHANOINE, GENERAL, the successor of General Zurlinden in the Brisson cabinet. One of the first acts of his administration was the transfer of Col. Picquart's trial from the civil to the military authorities. A sensational story characteristic of the times, was circulated, to the effect that he had unwittingly signed the papers in this case, which had surreptitiously been placed upon his desk by Gen. Zurlinden's orders when the latter gave up the office. See FRANCE (paragraphs on History).

CHAPLEAU, SIR JOSEPH ADOLPHE, K. C. M. G., Q. C., LL. D., prominent Canadian politician, died in Montreal, Quebec, June 13, 1898. He was born in Ste. Thérèse de Blainville, Terrebonne county, Quebec, November 9, 1840; was educated at Terrebonne and at St. Hyacinthe College; in 1861 he was admitted to the bar and practiced in Montreal. He represented Terrebonne in the Quebec legislature in 1867, and in February 1873, became Solicitor-General in the Ouimet administration. It was also in this year that he was made a Q. C. by Lord Dufferin. He was provincial secretary under M. de Boucherville from January 1876, to March 1878, at which time, the ministry being dismissed by Lieut-Gov. Letellier de St. Just, Sir Joseph was chosen leader of the Conservative opposition in the Quebec assembly. He retained this position until October 1879, when he was appointed Provincial Premier. In 1882 he entered the Dominion House of Commons; in 1891-92 he was in the Abbot ministry first as Secretary of State and subsequently, for a short time, as Minister of Customs. He became by appointment Lieutenant-Governor of Quebec in December, 1892, and remained in that position until his retirement in February 1898. He was succeeded by Hon. Judge Jetté.

CHARCOAL (in the purification of spirits). From a series of experiments made by M. Glasenapp it has been shown that charcoal does not absorb fusel oil, but acts chemically by reason of the oxygen condensed in its pores. The fusel oil is oxidized to ketones and aldehydes, and the latter partially to acids, which then to some extent, act on the alcohols, forming compound ethereal salts (compound ethers). These various mixed products cause the characteristic odor and taste. Charcoal absorbs these products to a large extent; in fact filtered spirits often show less aldehydes than the unfiltered sample. The author advises treating the regenerated charcoal in a current of dry air so as to thoroughly impregnate it with oxygen.

CHARITIES. *Municipal and County Charities in the United States.*—The material is lacking for a complete account of the nature and comparative efficiency of the public institutions of charity in the cities and counties of the United States but the National Conference of Charities and Correction has covered a part of the field in a report which appeared in May 1898. This report deals with the municipal and county charities in the seventy-three cities of the United States which had a population of more than 40,000 in 1890. Some of the general conclusions of the committee which made the investigation are of interest. The National Conference had previously investigated municipal charities and published a report on the subject in 1888. This report pointed out the inferiority of the municipal charities to those of the State and gave as the reasons for this inferiority the less adequate appropriations, the inferior classification, the government by committees of boards of supervisors instead of independent boards of trustees and the greater liability to interference by partisan politicians. As to the inferiority of the municipal charities, the conclusion of the committee in 1898 was the same as that advanced in the earlier report. Nevertheless the municipal charity work showed an improvement in common with the other departments of municipal activity under the influence of the new progressive ideas.

A comparative study of the municipal charitable institutions of the United States reveals at once the different system in operation in the New England States from that

which prevails in the Central and Western States. In the New England States the municipal government administers poor relief. In the Central and Western States where the county system has prevailed the cities have remained merely administrative parts of the counties in respect to all matters of poor relief. Thus in Chicago there are no municipal charities. The almshouse, and hospital and insane asylum are managed by Cook county, which also distributes outdoor relief in the city. In this latter respect, however, Chicago differs from most of the cities of the Central and Western States since outdoor relief is with them a municipal function. Of the first ten cities in point of population (according to the census of 1890) eight manage their own charities, while the remaining two, Chicago and Buffalo, are merely parts of counties. In the cities which manage their own charities there has been established a department of charities which takes its place by the side of the other municipal departments, but while the tendency has been toward an independent municipal management of poor relief, there has also been a tendency for the State to assume control of two special classes of dependents, namely, the children and the insane.

As to the efficiency of the municipal administration of poor relief, it may be said that the department of charities has been administered with about the same degree of ability as the other municipal departments. Where these other departments have been managed in a corrupt and inefficient manner, the department of charities has been no exception to the rule. It has suffered as much from partisan administration as any of the other public departments.

Under the impulse of municipal reform, improvements have been introduced here as in the other branches of the cities' administration. Conspicuous instances are the reorganization of the charities of New York City and Boston and the improvement secured for the charities of Baltimore in the provisions of the new charter which will take effect January 1, 1900. One sign of the more rational ideas which are gaining ground in charity administration is the tendency to differentiate the classes of the dependents. It seems to be recognized that the placing of two or more of these classes, which of course require entirely different kinds of administration, under the control of a single head is a bad plan. There is therefore a tendency to place the destitute, the insane and the criminal classes each under separate administrative control. In New York City this division has been recognized. The insane have been turned over to the control of the State, and the department of Charities and Correction has been divided into two departments, one of Charities and the other of Correction. In Boston there are five separate departments, namely: for adult paupers, for destitute children, for the insane, for criminals, and a department for investigation, registration, etc. On the other hand, an illustration of the failure to apply this principle is afforded by Chicago where the county gives to the same board of commissioners the control over the almshouse, insane asylum, county hospital, the building of roads and several other important matters.

Another point discussed in the report of the committee was the relative efficiency of an administration by means of a board of unpaid trustees and an administration conducted on the same principle as the other municipal departments, that is by means of one or more salaried commissioners. The former method is employed in Philadelphia, Boston, Baltimore and San Francisco, and the latter in New York, St. Louis, and Cleveland. The point urged on behalf of the unpaid board is that there is less chance for the entrance of partisan politics into appointments. And it is also presumed that the men appointed to these positions will have a wider knowledge and show a more disinterested spirit in the administration. These considerations, however, are mainly theoretical. Experience has not proved that the unpaid board is free from partisan influences. Moreover the volunteer officer is often apt to shirk duties for which he receives no payment, and there is frequently a bad result from the division of responsibility. The concentration of charity administration and the payment of officers seemed to the committee more in line with municipal development in the United States and in spite of the danger from the spoils principle, to have the advantage in respect to the promptness of service and the chance for executive ability to make itself felt. This concentration of authority of course lays the responsibility clearly on the executive and the public knows exactly on whom to place the blame for shortcomings.

The main emphasis was laid by the committee not on the matter of organization, but on the attitude of the people toward charitable work. The improvement in this work during the past ten years was, in their opinion, due to the greater interest of the people in the subject. The work of municipal charities has been brought powerfully to the attention of the people and a public sentiment in their favor has been aroused. There is, furthermore, a more watchful spirit among the people than before.

The limits of this article will not admit of a description of all the cities included in the committee's report. Some idea of the subject, however, may be had from an account of the charitable activities of the first ten cities in order of size:

New York.—The public charities of New York City are administered by three salaried commissioners, each having exclusive administrative control in different divisions of the city, namely: one in the Boroughs of Manhattan and the Bronx, one in the Boroughs of Brooklyn and Queens, and one in the Borough of Richmond. They are appointed by the Mayor for six years and are subject to removal without assignment of cause for the first six months of that time, after which they can be removed only for cause. The appointment and removal of subordinate officers in the district of which he has charge is wholly in the hands of each commissioner. The committee gives the following list of institutions in New York City showing the number of inmates toward the close of the year 1897:—

In the Boroughs of Manhattan and the Bronx.	
Bellevue Hospital.....	709
Gouverneur Hospital.....	40
Harlem Hospital.....	42
Fordham Hospital	26
City Hospital.....	695
Metropolitan Hospital.....	440
Almshouse	2,285
Infants Hospital	422
Children's Hospitals and Schools on Randall's Island.....	856-5,515
In the Boroughs of Brooklyn and Queens.	
Almshouse	1,337
Hospital	459-1,796
In the Borough of Richmond.	
Almshouse	113- 113
<hr/>	
Total in New York City.....	7,424

The total appropriations for these institutions for 1898 were \$1,671,213.

According to the new charter the commissioners are forbidden to dispense any kind of outdoor relief except to the adult blind and for transportation of non-residents. In respect to destitute and neglected and wayward children, it is the city's custom to place them in institutions under private control and allow \$2.00 a week for their support. In 1898, according to the committee's report, there were twenty-five of these institutions in the Borough of Manhattan and the Bronx. And the average number of inmates was 15,000, the support of whom costs the city about \$1,600,000 a year. Children over two years of age are for the most part committed to these institutions by magistrates. In Brooklyn a similar plan is followed. In the Borough of Richmond (Staten Island) it has been the custom to board destitute children in private families subject to supervision by members of the State Charities Aid Association.

Since 1896 the city has maintained a municipal lodging house on First avenue near 23d street, where each lodger is subjected to a medical examination and obtains a bath and a clean bed.

The Department of Correction, with one salaried commissioner at its head whose term is also for six years, controls the correctional institutions in New York City, including the "Tombs" prison, five district prisons, the New York County Penitentiary, the Kings County Penitentiary, and the New York City workhouse. The care of the dependent insane is in the hands of the State which controls twelve hospitals for this purpose. The inmates numbered 20,843 on October 1, 1897. The administration is by means of unpaid boards of managers appointed by the Governor under the control of the State Commissioner of Lunacy, which has three paid members also appointed by the Governor. In New York City the dependent insane are confined for the most part in the Manhattan and the Long Island State Hospitals.

Chicago, Ill.—Here, as has been said, the administration of charity is in the hands of the county, which includes a somewhat wider district than the city. The County Board, which consists of fifteen salaried commissioners, manages the institutions through officers appointed by its president. These officers are three in number and comprise the Superintendent of the County Infirmary and Insane Asylum, the Warden of the Cook County Hospital and the County Agent for Outdoor Relief. The inmates in the county institutions on January 1, 1898, numbered 3,822 of whom 1,482 were in the Infirmary (Almshouse), 1,445 in the Asylum, and 895 in the Hospital. The cost of managing these institutions for the year 1897 was \$718,872. The county also spent \$44,000 in contributions to industrial schools. The city of Chicago contributes little to charitable work and it gives no outdoor relief. The county distributed \$136,200 in outdoor relief in 1897. The Cook County Commissioners administer both the charitable and correctional institutions of the city. The care of the

insane is a charge on both the city and the county, the State allowing each county to send a certain number of the insane to the State institutions, but requiring them to retain or take back cases when the accommodation in the State hospitals becomes inadequate. The police department dispose of the destitute children, sending them to the St. Vincent Orphan Asylum; the Foundling's Home, the Visitation and Aid Society, the Humane Society and the Home of the Friendless. The number of children placed in these institutions in 1897, together with a few for whom homes were found in private families, was 231.

Philadelphia, Pa.—In Philadelphia proper the relief of the poor is in the charge of a Department of Charities and Correction consisting of five unpaid directors appointed by the Mayor for five years and divided into a Bureau of Charities and a Bureau of Correction, each composed of the president of the department and two directors. The number of inmates in the city institutions on January 1, 1898, and the expenses of management during the previous year were as follows:—

Philadelphia Almshouse and Hospital.....	4,068	\$503,127.01
House of Correction (semi-penal).....	1,611	229,563.60
Municipal Hospital for Contagious Diseases.....	173	75,134.69
	<hr/>	<hr/>
	5,852	\$807,825.30

A considerable sum, amounting in 1897 to \$142,675, is contributed by the city to private institutions. The only form of outdoor relief given by the city is free medical treatment. The city maintains no free lodging house but has made an arrangement with the Charity Organization Society whereby tickets are given to homeless persons entitling them to two meals, lodging and bath at the Wayfarers' Lodges. A work test is imposed in connection with the granting of this privilege. In 1897 only \$1,000 was contributed by the city for this purpose. As in Illinois, the care of the insane is a charge on both the county and the State, each sharing the expense about equally. The report gives the number of insane persons in the Philadelphia Almshouse and Hospital as 1,243 on January 1, 1898, while 1,733 from Philadelphia were in State asylums. The majority of the destitute children cared for by the city are supported in private institutions, which on January 1, 1898, contained 349. Temporary care of destitute children is afforded at the Almshouse, and foundlings and sick children are taken at the Philadelphia Hospital. In both these institutions on January 1, 1898, there were 114. A few children have been placed in private families. In the outlying districts of Germantown, Holmesburg, Roxborough, Byberry and Bristol there is an independent administration of poor relief.

St. Louis, Mo.—Here the general supervision of charitable institutions is in the hands of an unpaid board of commissioners of five members appointed by the Mayor, but the direct control of institutions of charity and correction is divided between the departments. The Health Commissioner controls the four public institutions, namely, the City Hospital, the Female Hospital, the Insane Asylum, and the Poorhouse, the number of whose inmates on January 1, 1898, was 2,906, of whom 1,529 were in the Poorhouse. The Board of Public Improvements controls the Workhouse, and a Board of Managers appointed by the Mayor controls the House of Refuge and Correction for Children. The superintendents of charitable institutions are appointed by the Mayor. \$474,236.46 were expended for the four charitable institutions during the year ending April 1, 1897. The city makes no contributions for private charities except in the case of foundlings, for the care of whom it contributed in the year ending April 1, 1897, \$16,199.99. Little outdoor relief is granted and the city maintains no lodging house. Such provision as is made for homeless persons is afforded through the police department. The city takes charge of the insane, of whom at the beginning of 1898 there were 1,332. The House of Refuge and Correction for Children contained 354 inmates on January 1, 1898. The city's foundlings are cared for in private institutions which receive contributions from the city government. The report states that in 1897, 352 foundlings under three years of age were maintained in these institutions and that of these 157 died. This is a very extraordinary death rate as will appear by a comparison with tables of infantile mortality which show that for Great Britain the death rate of children under one year of age was 14.5 per 100 and for Bavaria, where the death rate was highest, 30.6.

Boston, Mass.—Three boards, each composed of seven members, have the care of the poor and the insane in the institutions of Boston, and the overseers of the poor, twelve in number, have charge of outdoor relief. The three boards are the Pauper Institution Trustees, the Insane Hospital Trustees, and Trustees for Children. The term of office for the members is three years and all are appointed by the Mayor. The report gives the following table showing the charitable institutions owned and controlled by the city with their census on January 1, 1898, and the cost of their maintenance for the year ending February 1, 1898.

Institutions.	No. of Inmates.	Cost for Year.
Boston Insane Hospital, Austin Farm.....	338	\$69,582.44
Boston Insane Hospital, Pierce Farm.....	178	47,621.21
Boston Almshouse, Charlestown Almshouse.....	137	14,165.06
Boston Almshouse, Long Island Almshouse.....	828	84,097.74
Marcella Street Home (children).....	461	44,879.97
City Hospital.....	672	192,481.32
Parental School (correctional).....	165	22,997.88
House of Reformation (correctional).....	158	27,265.36
Temporary Home (women).....	26	5,744.46
Wayfarers' Lodge (men).....	41	8,427.06
Small-pox Hospital.....	0	
Galloupe's Island (quarantine)	1	

In 1897 the sum of \$116,722.19 was contributed for outdoor relief. Private charities received no contributions from the city. The city supports two lodging houses. Its correctional institutions are under a separate department. The city takes care of its insane, who on January 1, 1898, were distributed as follows:—

Danvers Lunatic Hospital.....	70	
Taunton Lunatic Hospital.....	91	
Worcester Lunatic Hospital.....	96	
Worcester Insane Hospital.....	153	
Westborough Insane Hospital.....	143	
Northampton Lunatic Hospital.....	1	
Tewksbury Insane Asylum.....	75	
Bridgewater Insane Asylum.....	29	
Medfield Insane Asylum.....	218	
Boston Insane Hospital (not all being city charges).....	516	
Insane Boarders.....	34	
Insane in Almshouse.....	23	
		<hr/> 1,449

In addition to the above there are in

Hospital Cottages (epileptics).....	12	
Hospital for Inebriates (dipsomaniacs).....	67	
School for Feeble-minded	88	167
		<hr/> 1,616

Institutions for children are maintained by the city which also places a considerable number in private families. On January 1, 1898, the Marcella Street Home was caring for 461 children of whom the majority had been placed out at board. During the previous year but two deaths occurred among the children. The State cares for foundlings and abandoned children.

Baltimore, Md.—Important changes were made in the administration of charities by the new charter which is to go into effect on January 1, 1900. The principle adopted is that of management by an unpaid board, the supervisors of city charities, who are appointed by the Mayor for six years. These are to take the place of the present Trustees of the Poor, seven in number and serving for two years. The City Almshouse is the only charitable institution owned and maintained by the city. The cost of its maintenance during 1897 was \$105,000 and on January 1, 1898, the number of inmates was 1,342. A considerable sum is contributed by the city for the maintenance of private charitable institutions and societies, amounting in 1897 to \$106,775. Besides the money spent in these ways there were appropriations for reformatories, for insane hospitals and for the deaf and dumb. The city maintains no lodging house, but temporary lodgings are afforded by the Almshouse or by the Friendly Inn, which is a private institution to which the city contributes \$1,000 each year. Separate authorities have charge of the charitable and correctional institutions. The care of the insane is divided between the city and the State, but there is a tendency to place it wholly with the latter. The destitute children are supported by the city in private institutions.

San Francisco, Cal.—Here, too, there is an unpaid body in charge of poor relief. It is the Board of Health appointed by the Governor for four years. The city charitable institutions contained 1,523 inmates January 1, 1898, and the cost of running the institutions during the previous year was \$161,003.45. Besides this the city contributed \$20,639.50 to private institutions. No outdoor relief is given by the city and there is no lodging house, homeless persons receiving temporary lodgings at the city prisons

and the City Receiving Hospital. The charitable and correctional institutions are administratively distinct. The State has charge of the insane. The State also bears the chief expense of maintaining dependent children, the city having no institution for this purpose under its immediate control.

Cincinnati, O.—The relief of the poor is here in charge of the Superintendent of the Infirmary and six Overseers of the Poor; the latter are a paid body appointed by the Board of Affairs, and not more than three of them can be from any one political party. The city charitable institutions are the House of Refuge, the Hospital, and the Infirmary, which had on January 1, 1898, 1,761 inmates and the cost of maintenance during the year previous was \$275,445.85. The city contributes nothing to private institutions. In outdoor relief it spent during 1897, \$11,946.92. It has no lodging house and homeless persons find shelter in the police stations. The correctional institutions of this city are under separate administration. The care of the insane is divided between the State and the county. Dependent and delinquent children are maintained by the city in the Cincinnati House of Refuge and none are supported by the city in private institutions. A few are placed in family homes.

Cleveland, O.—The Director of Charities and Correction has charge of the relief of the poor. He is a salaried officer appointed by the Mayor. The charitable institutions are the City Infirmary and the City Hospital, which contained on January 1, 1898, 791 inmates and cost the city during the previous year \$93,136.93. The city contributes nothing to private charities. In outdoor relief it expended in 1897, \$39,853.06. There is no lodging house maintained at the public charge and homeless persons are provided for in a private institution. The city does not take care of destitute children. These are provided for by the Cleveland Humane Society.

Buffalo, N. Y.—Here the control of charities is in the hands of the county, the officials in charge being the County Superintendent of the Poor and the Keeper of the Almshouse, who are elected for three years. There is a County Board of Supervisors which exercises general control over the administration of the charities. The city has no institutions for the relief of the poor, but gives outdoor relief through the Overseer of the Poor, an officer elected for a term of four years. The county has one charitable institution, the Erie County Almshouse, with 747 inmates on January 1, 1898, and costing for maintenance during 1897, \$125,245.46. The city contributes to the hospitals alone. The county contributes per capita to the hospitals and the children's homes. For the year ending July 1, 1897, the city contributed \$109,626.98 in outdoor relief. There is no free lodging house and homeless persons are referred to the Charities Organization Society. The State has charge of the insane. The county supports destitute children in private institutions and also places out some in private families through agents employed by the County Board of Supervisors.

State Charity in the United States.—In the United States there is in general no expressed recognition in the constitutions of the several States of the obligation to care for dependent members of the community. The constitution of North Carolina, however, is an exception to this rule. It is there provided in article II, section 7, that "Beneficent provision for the poor, the unfortunate, and orphan, being one of the first duties of a civilized and Christian State, the General Assembly shall at its first session appoint and define the duties of a Board of Public Charities, to whom shall be entrusted the supervision of all charitable and penal institutions, and who shall annually report to the Governor upon their conditions with suggestions of their improvement." In no other State is this so explicitly stated in the constitution. In New York, however, the revised constitution adopted in 1894 declared it to be the duty of the State to supervise the defective, destitute, insane and criminal, and it directed the legislature to provide for State boards or commissions of charity, lunacy and prisons which should visit and inspect all institutions for dependents or delinquents in the State. It was later provided by law that the State Board of Charities should have supervision over all county, municipal and private charities. And the constitution of Nebraska, South Dakota, and Wyoming, each implies the existence of such an obligation on the part of the State by reference to certain administrative bodies which shall control the charitable, reformatory and penal institutions.

The present theory of poor relief both in United States and in England is that the government is under no obligation to do for men what they are able to do for themselves and in the case of able-bodied dependents the attempt is made to make the conditions under which they obtain public relief so unpleasant that they will be unwilling to accept it. This principle is of course in marked contrast to that idea of public charity which obtained in England during the reign of George III when it was the current belief that the government was in duty bound to give either employment or outdoor relief to every idle person. Though charity administration in the United States has made great advances in recent years, it is still far from satisfactory. The presence in the field of the various philanthropic bodies both private and public has led to confusion and in some cases to mistaken charity. A more complete cooperation between philanthropic workers is one of the needs of the time.

While only the States above named have in their constitutions expressed or implied statements of the obligations to provide poor relief, the other commonwealths practically apply this principle in their administration. Recently the State Governments have undertaken the care and treatment of epileptics. Ohio was the first State to do this, having opened an asylum in 1893, and Massachusetts, California and New Jersey have adopted a similar plan. In New York State in 1894 a colony known as the Craig Colony was established for epileptics. It was named after the late Oscar Craig of Rochester, formerly president of the New York State Board of Charities and it is the first institution of the kind established in the United States. See EPILEPTICS.

These five States have acknowledged in their fundamental law the principle that the State has duties to perform to the dependent, defective, and delinquent members of the community. Sixteen other States have practically acknowledged this principle by the establishment of supervisory boards with control over such matters, but in twenty-four States there is no official State control over the care of dependents. In the amount of charitable work done no State equals the State of New York. The supervision of charities is there entrusted to the State Board of Charities, consisting of twelve members appointed by the Governor with the advice and consent of the Senate. This State Board has the power and duty to visit, inspect, and supervise "all institutions, societies, or associations which are of a charitable, eleemosynary, correctional or reformatory character, whether State or municipal, incorporated or not incorporated, which are made subject to its supervision by its constitution or by law." It is empowered to inspect all institutions whether public or private and to enforce a proper administration of them. The following list taken from an article by Mr. Robert W. Heberd, Secretary of the State Board of Charities, published in November 1898, shows the vast amount of real and personal property possessed by charitable institutions in the State of New York:

State Institutions.....	\$5,450,953.60
County Almshouses	2,993,930.00
City and Town Almshouses.....	6,842,000.00
Charity Organization Societies.....	346,082.01
Day Nurseries.....	271,416.46
Dispensaries	1,613,983.17
Fleemosynary-Educational Institutions.....	850,569.07
Employment Societies.....	171,217.76
Fresh Air Charities.....	479,035.96
General Out Door Relief Societies.....	2,274,544.49
Homes for the Aged.....	17,845,107.17
Homes for the Blind.....	244,400.00
Homes for Children.....	25,581,350.33
Homes for Discharged Prisoners.....	161,997.75
Homes—Temporary for Men and Boys.....	124,340.01
Homes—Temporary for Women and Children.....	223,314.45
Homes—Temporary for Women and Girls.....	177,252.00
Homes and Hospitals for Consumptives.....	583,000.00
Homes and Hospitals for Convalescents.....	52,700.00
Homes and Hospitals for Epileptics.....	120,000.00
Homes and Hospitals for Incurables.....	1,611,855.60
Homes and Hospitals for Inebriates.....	488,307.70
Homes and Missions for Immigrants.....	2,441,600.00
Hospitals	29,068,051.55
Humane Societies.....	6,600.00
Legal Aid Societies.....	19,715.00
Reformatories for Children.....	165,578.13
Reformatories for Women and Girls.....	1,618,172.24
Relief for Sick Poor, Societies for.....	335,508.00
Schools for Deaf.....	1,224,691.65
Total	\$103,364,554.21

This by no means shows the extent of the funds appropriated to charitable objects since it does not include the amounts expended through minor church organizations and through various associations such as the King's Daughters and Ladies Aid Societies or by purely personal charities. On October 1, 1897, the same writer gives the number of inmates in the institutions subject to the supervision of the State Board of Charities as 74,674 and this does not include the large number of people who are temporary beneficiaries in the institutions, especially in the hospitals. When these latter are added in, the number of persons cared for by the State in all classes

of institutions was 269,147; and besides this it is said that over a million and a half were treated practically free of charge in the dispensaries of the State, most of them being in Greater New York.

CHARITY ORGANIZATION SOCIETY, organized in 1882, to promote the welfare of the poor. Central Offices, United Charities Building 105 E. 22nd st., New York. Officers of Central Council—Robert W. DeForest, president; Charles S. Fairchild, 1st vice-president; C. D. Kellogg, 2d vice-president; J. Pierpont Morgan, treasurer; Edward T. Devine, general secretary. The Mayor of New York, President Police Department, President Health Department, President Department of Charities, Commissioner of Correction, U. S. Commissioner of Immigration John A. McKim, representing State Charities Aid Association; Professor R. Mayo Smith, representing Columbia University, are ex-officio members. For year ending June 30, 1898, 21,365 applications were received; receipts \$46,959, expenditures \$48,341. 531 societies and churches coöperate. The society maintains the Penny Provident fund; the Wayfarers' Lodge and Woodyard, which gave in 1897-98, 19,745 meals and 6,231 lodgings, and workrooms for unskilled women in Brooklyn. *The Charities* and *The Charities Directory* are published by this society.

CHARLTON, JOHN, Liberal member of the Dominion parliament for North Norfolk, Ontario, was appointed a member of the Anglo-American Joint High Commission (See CANADA) created in May, 1898. He was born near Caledonia, New York, February 3, 1829. In 1849 he accompanied his parents to Canada; engaged in trade in 1853 at Ayr, Ontario, and in 1859 became manager of a lumber business in Tonawanda, New York. Two years later he entered upon the same kind of business for himself and is still engaged in it. Mr. Charlton is well known for his advocacy of trade reciprocity between the United States and Canada.

CHAUTAUQUA ASSEMBLY, organized in 1874 by Lewis Miller and John H. Vincent, with courses of instruction in art, science, language, literature, music, etc. Its annual sessions are held in Chautauqua, N. Y. President, Lewis Miller, Akron, Ohio; secretary, W. A. Duncan, Syracuse, N. Y. The Chautauqua Literary and Scientific Circle was organized in Chautauqua in 1878 to spread the influence of the Assembly throughout the country. The course extends four years, but each year is complete in itself. The membership exceeds 250,000. General superintendent, J. L. Hurlbert, New York; secretary, Kate F. Kimball, Buffalo, N. Y. The Chautauqua School of the English Bible was organized in 1888. In 1882 a charter for Chautauqua University was granted and in 1884, the Chautauqua School of Theology received its charter. In 1898 the Collegiate Department numbered 52 instructors. The branches were: I. English language and literature; II. School of modern languages; III. School of classical languages; IV. School of mathematics and science; V. School of social science; VI. Schools of sacred literature; VII. School of pedagogy; VIII. School of music; IX. School of fine arts; X. School of expression; XI. School of physical education; and XII. School of practical arts. In addition to these there are many lectures, concerts, and entertainments, special nature study work under the auspices of the agricultural department of Cornell University, embracing entomology, ornithology and invertebrate zoology.

CHEMICAL PRECIPITATION. See SEWAGE PURIFICATION.

CHEMICAL SOCIETY, AMERICAN, was organized in 1876 "for the advancement of chemistry and the promotion of chemical research." It comprises the following local sections: Rhode Island, Cincinnati, New York, Washington, Lehigh Valley, Nebraska, Chicago, North Carolina, Columbus, and the Northeastern section. The meetings of the local sections are held weekly at various dates. President, Edward W. Morley, Adelbert College, Cleveland, Ohio; vice-presidents, the presiding officers of the local sections; secretary, Albert C. Hale, 551 Putnam avenue, Brooklyn, N. Y.

CHESS. The most important event of 1898 was the International Chess Tournament at Vienna from May 31 to July 25, at which H. M. Pillsbury tied with Dr. Tarrasch for first place, their scores being 28½. Dr. Tarrasch won in play-off of the tie by 2½ to Pillsbury's 1½. At another International Tournament, held at Cologne in August, Amos Burn won the first prize. The United States championship was won by Pillsbury on April 1 in Brooklyn against Showalter, the stakes being \$2,000. In the third international cable match between Great Britain and the United States for the Newnes Trophy, the British players won by a score of 5½ to 4½. In the inter-collegiate tournament in which Harvard, Yale, Princeton, and Columbia took part, Harvard was successful, this being the fifth successive victory won by the Harvard players.

CHICAGO ARCHITECTURAL CLUB. See SCULPTURE (paragraph Exhibitions).

CHICAGO DRAINAGE CHANNEL. See CANALS (paragraph Drainage Canals).

CHICAGO, UNIVERSITY OF, situated between Washington and Jackson parks, Chicago, Illinois, was founded in 1889 by Mr. John D. Rockefeller; instruction began in October, 1892. The institution is coeducational and denominationally is Baptist. Though less than a decade has passed since its organization the university is well equipped both in the undergraduate and in the graduate departments. There is a divinity school, and schools of law, medicine, engineering, technology, fine arts, and music will be established as soon as the funds of the university permit. Connected with the astronomical department is the Yerkes Observatory near Geneva lake, Wisconsin, about seventy-five miles from Chicago. In 1898 the library comprised about 341,740 volumes. According to the *Annual Register* for the year ending July 1898, the officers of instruction numbered 209; the number of students was: In the graduate schools, 1,113; in the colleges, 1,293; in the divinity school, 371; total, deducting repetitions, 2,307. The degrees conferred during this period were: A. B., 61; S. B., 16; Ph. B., 60; D. B., 32; Theol. B., 1; A. M., 10; S. M., 5; Ph. M., 3; Ph. D., 37. The president since the foundation of the university has been William Rainey Harper, Ph. D., D. D., LL. D. See UNIVERSITIES AND COLLEGES.

CHILDRENS' AID SOCIETY, organized in 1853, for the education of poor children and for procuring homes for them in moral districts. In 1898 it assisted 33,486 persons. It has 20 industrial schools, kindergartens, and owns property to the value of \$600,000, including the following lodging houses for boys and girls. The Brace Memorial for boys, 9 Duane street; the Elizabeth Home for Girls, 307 E. 12th st.; East Side for boys, 287 E. Broadway; West Side for boys, 201 W. 32nd st.; Forty-fourth street for boys; Tompkins Square for boys; and the Fogg for girls, 552 W. 53rd st. The income in 1898 was \$297,943; expenditures \$311,100. President, D. Willis James; secretary, Clarence L. Brace. Headquarters, United Charities building, 105 E. 22nd st., New York.

CHILE, a republic on the Pacific coast of southern South America, comprises 23 provinces and 6 territories, whose aggregate area is 293,790 square miles. This area includes the province of Antofagasta which was ceded to Chile by Bolivia in 1884, and those of Tacna and Tarapacá, ceded the same year by Peru. The cession of Tacna, including Arica, was provisional. (See concluding paragraph and the article PERU.) According to the census of 1895 the population was 2,712,145; it is likely, however, that the actual population, including 50,000 Indians, is in excess of this and in 1898 it was thought to be about 3,300,000, of whom 1,500,000 are engaged in agricultural pursuits. According to the census of 1895 there were 1,263,645 males and 1,263,675 females. The foreign inhabitants numbered 87,077, of whom about 35,000 were Peruvians. The territory Magallanes is the largest district (75,292 square miles) and has the fewest inhabitants (5,170 in 1895); the smallest province is Valparaiso (1,637), the population of which in 1895 was placed at 220,756; the most populous province is Santiago, which in the same year numbered 415,636. Santiago is the capital (pop. 256,403); other important cities are Valparaiso (122,447), Concepcion (39,839), Talca (33,232), Iquique (33,031), Chillan (28,738), Serena (15,712), Antofagasta (13,530), and Curicó (12,669).

Government.—According to the constitution, which was adopted in 1833, the chief executive authority is vested in a President, who is chosen for a term of five years by an electoral college, and who is assisted by a Council of State and a ministry consisting of the following departments: The Interior, Finance, Foreign Affairs, War and Marine, Justice and Public Instruction, Worship and Colonization, Industry and Public Works. The Council of State is composed of five members appointed by the President and six members selected by the Congress. The President has the power of veto, but, as in the United States, a two-thirds vote passes a bill over such veto; a President is not eligible for re-election. The President in 1898 was Don Federico Errázuriz, who was elected June 25, 1896. The legislative authority devolves upon a Congress of two houses, a Senate and a Chamber of Deputies, Senators being chosen for six years and deputies for three by direct vote from the provinces and departments. The proportion is one Deputy for every 30,000 inhabitants, or a fraction not less than 15,000, and one Senator for every three Deputies. Eligibility for the lower house requires an annual income of about \$500, and for the upper house an income of about \$2,000. The provinces are administered by *intendentes*, and the subdivisions, or departments, by *gobernadores*, both nominated by the President. In the departmental capitals are the courts of first instance and throughout the country there are subordinate courts; besides these there are six courts of appeal, and in Santiago the High Court of Justice.

Finance.—The revenues and expenditures of Chile in pesos, as officially stated, were as follows up to 1894; for the years succeeding the estimates are given:

	1890.	1892.	1893.
Revenue.....	59,255,783	62,400,000	73,443,000
Expenditure.....	75,063,376	60,900,000	62,692,500
	1894.	1895.	1896.
Revenue.....	83,436,000	77,354,000	91,010,000
Expenditure.....	78,482,00		86,989,658
		1897.	1898.
Revenue.....		79,200,000	76,250,000
Expenditure.....		79,155,971	76,205,164

These revenues are derived chiefly from export and import duties and from the railroads; the chief expenditures are for the national debt and for public works and salaries. The public debt in pesos, June 1897, was: External, 247,893,664, including interest amounting to 12,675,733; internal including municipal, 30,169,042.

Currency.—In 1895 the Chilean government passed a resumption act establishing the gold basis. The effect of this was to raise the value of the Chilean peso to a little over thirty-five cents in gold and to enable merchants to make their contracts with some degree of certainty and accuracy. For a time it established confidence and kept down prices, "because the merchants did not have to add to the value of his merchandise an estimate for the unknown depreciation of the money of liquidation"; yet the law did not bring about the permanent condition desired. The Hon. Henry L. Wilson, United States Minister to Chile, in his report to the State Department on August 18, 1898, expresses the belief that this act would have been entirely successful had it been fully carried out. Credits, he said, were easy because of the faith in the stability of the currency and the law at first improved substantially the condition of the industrial and commercial classes. The necessity of large expenditure on account of the increase of the military establishment caused a heavy strain on the treasury and a departure from the policy indicated by the law. In midsummer, 1898, it was reported that a financial panic had set in in Chile. In July, the Congress suspended for thirty days payment of action at law for debts, and the banks, after the passage of this act, paid to depositors only such sums as were necessary to relieve their actual wants. Then came a message from the President to Congress on July 13, recommending the issue of 50,000,000 pesos in paper for the payment of all obligations in which the government had not made a special gold contract, and a law was passed to this effect on July 30, 1898. It authorized the issue of 50,000,000 paper pesos, the peso being equivalent at that time to 36.5 cents of American money. Opposition to this policy, according to Minister Wilson's report, came generally from small tradesmen, artisans, and people of the working classes who seemed to be heartily in favor of the gold standard. Support on the other hand was given to it by the landholders for the reason, as Mr. Wilson thinks, that the act enabled them to pay their mortgages in depreciated currency. The effect of the new law was to cause the disappearance of gold from circulation, although before its passage there had been some 45,000,000 in gold in currency. Gold as a commodity went to a premium of 40 per cent. Mr. Wilson believes that the chief burden of this depreciation fell upon the small tradesmen and wage-earners, for the former could not change their business methods readily and were obliged to sell at the old prices, and the latter were paid in currency that had depreciated 30 per cent. without being compensated by a proportionate rise in wages. Debtors including of course the government benefited from the change.

Banking.—There is no state bank in Chile, but in 1897 there were 20 joint-stock banks of issue with a total capital of 50,318,829 pesos and a registered issue of 13,448,261 pesos. The government obliged the banks to guarantee this note issue by satisfactory deposits in the Treasury. There are also a number of land banks.

Army and Navy.—The peace footing, which must not exceed 9,000 men, consists of 9 regiments of infantry, 8 of cavalry, 5 of artillery, and a corps of engineers. In 1896 the national guard was reorganized and all male citizens from twenty to forty years of age are obliged to serve. About 25,000 men are trained each year, and the total force numbers about 432,000. The Chilean navy is very considerable for a South American country. It is reported to consist of: 1 first-class battleship; 1 port-defense armor-clad; 1 first-class cruiser and 1 building; 1 armored cruiser; 4 second-class cruisers; 11 third-class cruisers and 2 building; 5 first-class and 8 third-class torpedo boats; 4 torpedo destroyers building. The complement is given as 1,860 officers and men. Among these vessels are the well known small battleship *Capitan Prat*, the first-class cruiser *Esmeralda*, and the armored cruiser *O'Higgins*.

Industries.—Chile has been recognized as one of the most progressive and prosperous countries of South America. Though the country is essentially agricultural,

one and a half millions of the population being engaged in agricultural pursuits, much attention is given to the exploitation of its mineral wealth, and manufacturing interests, though not extensive, are increasing. Farm labor is directed chiefly to the cultivation of cereals and the raising of cattle, sheep, and goats, but large quantities of fruits and vegetables are also produced. The annual production of wheat is about 28,500,000 bushels of wheat and about 8,500,000 bushels of other grains, while each year there are raised 500,000 head of cattle and 2,000,000 sheep, goats, etc. The annual mineral output is reported as follows: Gold, 500 kilogrammes (1 kilogr. equals 2.2046 lbs.); silver, 160,000 kilogrammes; copper, 400,000 metric quintals (1 quintal equals 220.46 lbs.); coal, 10,000,000 metric tons (1 metric ton equals 2,204.6 lbs.); manganese and iodine are also produced. The chief mineral export is nitrate and in this Chile has practically a monopoly in the world's trade. The fields are estimated to extend over an area of about 220,350 acres, and to contain 2,316,000,000 metric quintals of nitrate. The following figures have been given for the yearly output in tons: 1884, 550,000; 1885, 420,000; 1886, 443,000; 1887, 702,000; 1888, 773,000; 1889, 903,000; 1890, 1,009,000; 1891, 877,000; 1892, 804,842; 1893, 938,871; 1894, 1,082,285; 1895, 1,220,000; 1896, 1,092,000. According to a report in the *Bulletin of the Bureau of American Republics* for September 1898, the exportation of nitrate, together with that used in Chile for 1897, was 2,344,161 metric tons. The same report states that the output continued to increase in 1898, the amount for the first quarter being 693,485 metric tons, while during the corresponding period of 1897 there was a production of only 388,532 metric tons. In this year there were but 30 nitrate factories and in 1898 there were 44. Notwithstanding the development of the industry, the financial return was not commensurate, for the prices have continued to fall since 1895. To a considerable extent this industry is controlled by English capital. About 39 per cent. of the nitrate is sent to Germany, 17.3 to France, 11.2 to Great Britain, and 10.9 to Belgium. In the department of Valparaiso, having a population of some 220,000, there were in 1895, 417 industrial establishments which during the year used raw material to the value of 20,057,573 pesos and employed 12,616 operatives, with 162 steam engines whose total horse-power was 1,766. This of course cannot be taken as indicative of the general industrial condition, for the great majority of manufactured goods consumed are imported. Among the more important factories are sugar refineries, breweries, mineral water factories, gas works, and wagon works.

Commerce.—The principal exports of Chile with the values in pesos, were in 1895: Nitrate, 45,528,000; silver, 4,918,000; copper, 4,881,000; cereals, 3,599,000; coal, 1,561,000; iodine, 1,443,000; leather, 1,022,000; gold, 248,000. The chief imports are foods, textiles, raw materials, and machinery. The following figures show the value of imports and exports, including bullion and specie, in pesos valued at about \$0.7711 United States gold:

	1893.	1894.
Imports.....	68,235,874	54,483,616
Exports.....	72,245,114	72,040,420

	1895.	1896.	1897.
Imports.....	69,206,552	74,082,805	65,502,805
Exports.....	72,919,882	74,359,414	64,754,133

It will be seen that the total value of the imports and exports for 1896 was greater than that of the following year by 18,185,281 pesos.

Shipping and Communications.—On January 1, 1896, the merchant marine consisted of 42 steamers and 146 sailing vessels, having a total tonnage of 105,642; the steam tonnage amounted to 29,931 tons net. In 1895 there entered from foreign ports 2,021 vessels of 2,732,000 tons, and cleared 1,919 vessels of 2,969,000 tons; entering vessels in the coasting trade represented a total tonnage of 6,232,000. There are English, French and German steamship lines between the Chilean ports and Europe by way of the straits of Magellan, and English and Chilean lines to Peru and Panama. The total length of railways in 1896 was 2,504 miles, of which the State owned and operated 1,057 miles, and the remainder, constituting fifteen different lines, was owned and operated by private companies. "The leading line is the Grand Central, belonging to the State, which is composed of three divisions—from Valparaiso to Santiago and thence to Melipilla, from Santiago to Talca, from San Fernando to Alcones, and from Pelequen to Peumo; from Talca to Talcahuano, San Rosendo to Traiguén, Santa Fé to Los Angeles, and Roblería to Victoria,"—a total, for the three divisions, of 766 miles. It was thought in 1898 that the 46 miles remaining unbuilt in the Transandine Railway would be speedily finished by the government. This road connecting Santa Rosa and Mendoza, 152 miles apart, will effect direct communication between Valparaiso and Buenos Ayres, 622 miles dis-

tant. The cost of the State lines at the close of 1893 was 64,459,179 pesos; the cost including 600 miles that will ultimately revert to the State was 77,540,011 pesos. At the beginning of 1896 the State telegraph lines aggregated 6,965 miles with 8,330 miles of wire and 205 offices; besides these there are over 2,600 miles of railway and private lines. In 1895 there were 617 post-offices; the postal revenue was 1,749,021 pesos, and expenditures 1,930,935 pesos.

Religion and Education.—The State religion is Roman Catholic, but all others are tolerated and respected. In 1896 subsidies amounting to 701,728 pesos were granted to the clergy for various church purposes. Civil marriage alone is recognized by law. Education is free. It is classified as "superior or professional, medium or secondary, and primary or elementary." In 1895 there were 1,248 public primary schools having 114,565 pupils; the average attendance was reported as 71,901 pupils and 2,145 teachers. For professional and secondary education there are the University and the National Institute at Santiago and various lyceums and colleges in the more important towns. In these institutions may be found departments of science, medicine, law, and fine arts, and the number of students in these departments in 1894 was 1,190; in the following year the total number of students in the National Institute and provincial colleges was 8,710. Besides normal, agricultural, and other special schools, there are in Santiago two government lyceums for girls, and ecclesiastical seminaries at the seats of the bishops. In 1895 there were 411 private schools with 18,052 pupils. There is a national library consisting of more than 88,000 volumes and 24,000 manuscripts. Besides public museums there are the National Conservatory of Music, the National Observatory, the Pedagogic Institute, the School of Arts and Trades, and the Institute for Deaf Mutes.

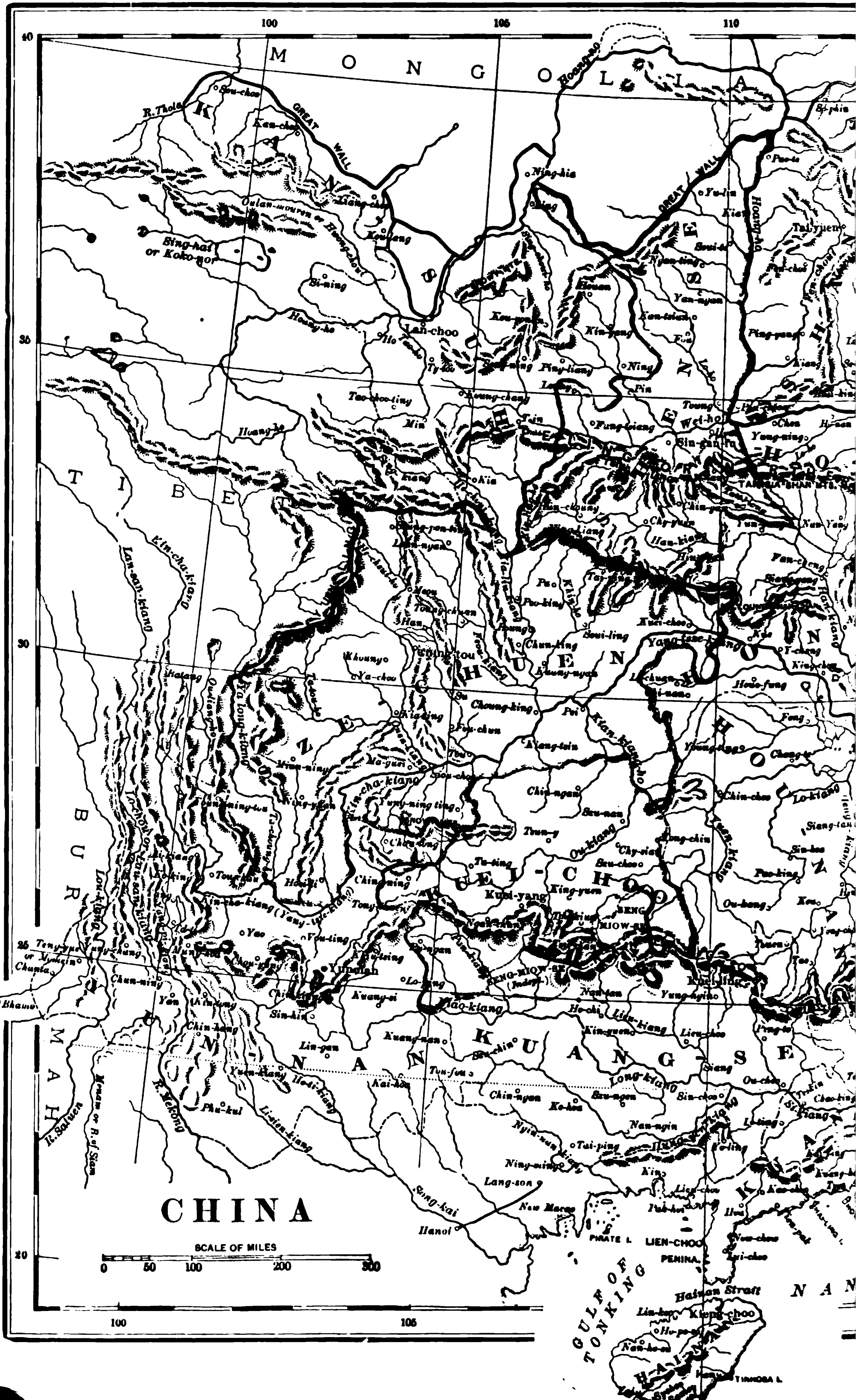
Events of 1898.—In April 1898, Chile and Peru came to an understanding over the long protracted dispute in regard to the provinces of Tacna and Arica. A treaty signed on October 20, 1883, had transferred these provinces from Peru to Chile for ten years, at the end of which time the people were to decide to which country they should belong. No agreement was reached as to the method of ascertaining the popular wish in 1893 nor in the five years that followed. In the latter part of April 1898 such an agreement was at length attained by the signing at that date of a treaty which determined the methods of taking the popular vote and left all disputes in regard to these and other details to the arbitration of the Queen Regent of Spain. (See PERU). On June 1, the President announced at the opening of congress that the appointment of arbitrators for the delimitation of the boundary had been agreed upon with the Argentine Republic. (For an account of the nature of this dispute and its outcome before the close of the year see the article ARGENTINA.) A new cabinet was formed early in April. An important subject of discussion in the summer was the question of the conversion of paper currency and the party opposed to conversion gained the upper hand. It was decided that \$50,000,000 of paper should be issued to be partly guaranteed by a charge on the custom houses and to be redeemed in three years and a half. The effect of this measure upon trade is described in a preceding paragraph. Gold at once went to a high premium. The confusion in the finances seriously hampered the government in its preparations for a possible war. On October 19, a ministerial crisis began and lasted until December 20, when a new cabinet was formed.

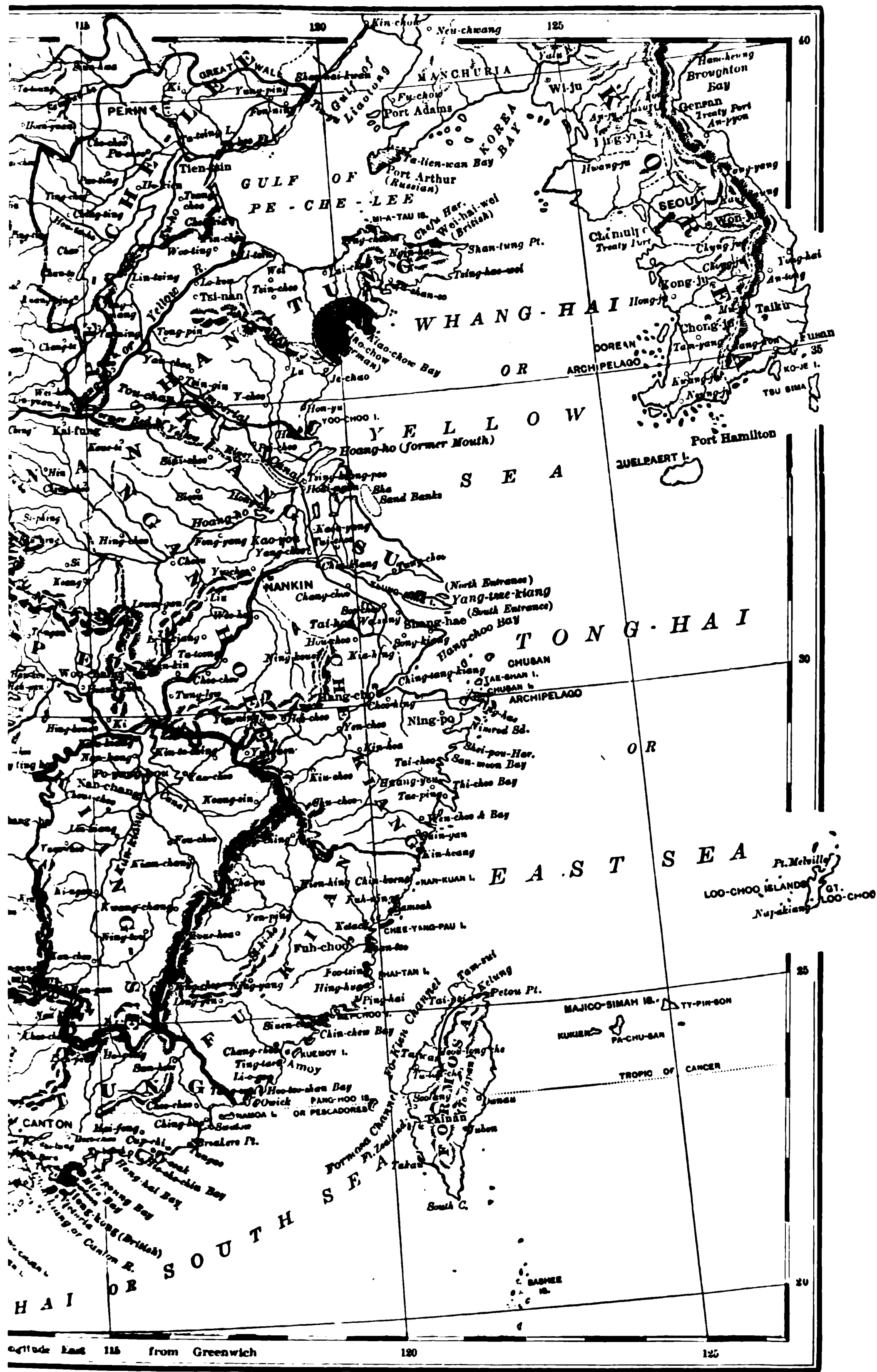
CHINESE EMPIRE, a vast territory in eastern Asia comprising China proper and the dependencies of Manchuria, Mongolia, Thibet, Jungaria and Eastern Turkestan. China proper, according to the latest estimates available in 1898, has an area of 1,336,841 sq. m. with a population of 386,000,000, and including the dependencies the area was 4,218,401 sq. m. with a population of 402,680,000.

Production and Industry.—Agriculture is the leading occupation and in general the land is divided into small holdings. In the north the principal crops are wheat, barley, maize, millet and other cereals together with peas and beans, and in the south, rice, sugar, indigo and cotton. The cultivation of tea and silk is of special importance, the former prevailing in the southern and western provinces and the latter being carried on with the best results in the provinces of Keang-su, Sze-chuen, Che-keang, Kwang-tung. Coal is said to appear in each of the eighteen provinces, especially in Shan-si and Honan, and China is reputed to have the richest supply of this mineral in the world. There is also a considerable amount of copper and iron.

The mineral contents of the Shantung peninsula, which has been acquired by Germany, are of great value. The coal measure formations are abundantly developed in the western peninsula, and form the most important mineral resource of that region not only on account of their abundance, but also for the reason, it is claimed, that in all southern and eastern Asia, there is no place where equally good coal is found so near to a shipping point. The presence of iron ores of good quality is also noted but they have not been worked. See GEOLOGY, COAL, and IRON.

The productive resources of China are, however, as yet but partially developed. Several important steps were taken in the year 1898 toward opening up the interior





to foreign enterprise, and an account of some of the concessions made by the government to foreigners will be found in succeeding paragraphs. Chinese industries develop but slowly. The principal manufactures are silk, cotton, linen and pottery. Of late years silk and cotton mills have been established in several parts of the empire. See COTTON AND COTTON INDUSTRIES.

Commerce.—In recent years the chief sharers in the foreign trade of China have been Great Britain and her colonies, the United States and Japan. In 1896 the value of the foreign trade of China in haikwan taels was, imports 202,589,994 and exports 131,081,421, the haikwan tael being equivalent to 82 cents in United States money on July 1, of that year. By far the greater part of the Chinese foreign trade was with Great Britain and Hong Kong. The principal exports were, in the order of their importance, silk, raw and manufactured, and tea, and the principal imports were cotton goods and opium. In this year the foreign trade of China was larger than ever before recorded; but in spite of certain disadvantages, such as the political disturbances and the injury to the import business caused by falling exchange, the returns for the year 1897 showed an improvement. In the United States Consular Reports for July 1898, there is a comparison between the foreign trade of China in 1897 with that of the preceding year. In 1896 the foreign trade was valued at \$270,633,000, and in 1897 at \$271,200,605. In the returns for imports for 1897 it appears that opium plays a less important part than in 1896. While it represented over 27 per cent. in 1896, it represented less than 14 per cent. in 1897. The trade in cotton goods showed a falling off as compared with the figures of 1896, although American cotton goods continued in demand and even showed some improvement. The export trade increased steadily and in this increase nearly every item shared during the year. The shipping for 1897 also increased, the number of entries showing 5,281 vessels as against 4,722 in the previous year. Of the total tonnage Great Britain had 65 per cent., China, 23 per cent., Germany 5 per cent., Japan, 2 per cent., Norway and Sweden 2 per cent., France 1 per cent., United States, 1 per cent., and all other countries 1 per cent. The direct imports from the United States in 1897 amounted to \$9,202,713, and the exports to the United States to \$13,181,563, reversing the relation of the previous year, when the direct imports exceeded in value the direct exports. In the year ending June 30, 1898, the exports to the United States were \$20,326,388, and the imports from the United States \$9,992,894. But returns in regard to the imports are not conclusive as to the actual amount of American goods consumed in China, since the carrying trade is largely in the hands of other nations and American goods are often set down as coming from the country in whose vessels they are imported.

Trade with the United States.—It was said that the American trade with China in 1897 was showing better prospects. More competent agents were chosen to represent the American manufacturers and there was a considerable importation from the United States of locomotives and machinery for mining plants. It was said, for example, that in the port of Chefoo in 1897 the imports from the United States were four times as large as those for 1893, with the single exception of oil, which however, had more than doubled; and during the first six months of 1898 this condition apparently continued. In the United States Consular Reports for August 1898, there is an instructive table presented showing the distribution of the Chinese foreign trade in 1897. From this it appears that the trade with the United States almost equaled the trade with the entire continent of Europe with the exception of Russia. The trade with Great Britain was \$39,138,943, and with the British dependency of Hong Kong \$111,240,273. Japan stood next and then came the United States with \$22,358,854. These figures when compared with the figures of 1890 show, that while the exports from Great Britain did not quite double in eight years, the exports from the United States trebled; and that the exports from China to Great Britain decreased, while those to the United States more than doubled. The American shipping also had increased, but even in 1897 American ships and tonnage stood seventh on the list. The activity of the German merchants in China has often been remarked. In 1897-'98 they continued as formerly very formidable rivals of the Americans. In Hankow the imports of the German trade showed a rapid increase in 1897-98 and with the exception of the tea trade, which was in the hands of the Russians and English, it was reported that almost all of the exports were controlled by the Germans. Considering that the German trade with Hankow is only 14 years old and that the English until recently have almost wholly controlled the shipping interests, the advance of German commerce is remarkable. The German merchants are cited by our consuls as affording most instructive examples of industry, energy and attention to business. Nevertheless, the United States, according to the latest reports available in 1898, continued to hold the second place to Great Britain among western nations in the importance of her trade with China, and in some regions, as for instance that of which Chefoo is the treaty port, the American commercial interests surpass those of any other nation. There is a chance for the expansion of American trade through the new policy of the Chinese government in granting railway concessions, as illus-

trated in a succeeding paragraph, and already there has been a considerable demand for steel rails, machinery and rolling stock. As a purchaser of Chinese goods the United States holds an important position. Of some commodities she is the largest purchaser, as for instance in the case of fire-crackers, of which the greatest part of the exports from China were sent in 1897 by sailing vessels to New York. The fact that the importation of American goods appears to be so rapidly on the increase is attributed in part to the cheapness of these goods, freights from America being lower than from Europe. The items in which the increase of imports from the United States is most marked are drills, sheeting and kerosene oil.

Treaty Ports.—One of the signs of the progressive spirit which has shown itself recently in the reign of the Emperor Kwang-su, is the opening of new treaty ports. Early in 1898 the United States Minister to China reported that the Emperor had opened the following places as treaty ports: Yo-Chou in the province of Hunan; San-tu-ao in the province of Fukien; and Chin-wang-tao in the province of Chihli. Yo-Chou is the first place opened to foreign trade in the province of Hunan. It is the centre of considerable trade in native produce and it is hoped that a large carrying trade will be developed when foreign steamers begin to run there. These three ports were opened by the imperial decree of March 31, 1898. A few weeks later the port of Woosung was also opened. In a report dated April 20, 1898, the United States Minister to China gave the following list of open ports together with the names of the treaties, the dates at which they were thrown open and the population of each place:

List of treaty ports and ports of call.			
Port.	Year.	Pop.	
Treaty of Nankin with Great Britain, August 29, 1842.			
Canton	1859	2,500,000	
Amoy	1862	96,000	
Fuchau.. ..	1861	650,000	
Ningpo	1860	255,000	
Shanghai	1854	475,000	
Treaty of Tientsin with Great Britain, July 26, 1858.			
Niuchwang	1861	60,000	
Chefoo	1861	35,000	
Swatow	1860	35,000	
Kiungchau	1876	40,000	
Not especially named in the treaty, but afterwards designated.			
Hankau	1862	800,000	
Chinkiang	1861	140,000	
Kiukiang	1862	55,000	
Pekin convention with Great Britain, October 24, 1860.			
Tientsin	1861	950,000	
Treaty between France and China, October 25, 1860.			
Nankin .....	....	Unknown	
Treaty with Russia, November 2, 1860.			
Kashgar .....	....	Unknown	
Chefoo convention with Great Britain, September 13, 1876.			
Ichang	1877	34,000	
Wuhu	1877	79,700	
Wenchow	1877	80,000	
Pakhoi	1877	20,000	
Treaty with France, June 26, 1887.			
Lungchow	1888	22,000	
Mengtsz	1888	12,000	
Manhao .....	....	Unknown	
Additional articles to the Chefoo convention with Great Britain, March 31, 1890.			
Chungking	1890	300,000	
Regulations appended to Sikkem-Thibet convention of 1890 with Great Britain, December 5, 1893.			
Yatung	1894	Unknown	

Port.	Year.	Pop.
Convention with Great Britain, March 1, 1894.		
Manwyne .....	....	Unknown
Treaty with Japan, Shimoneseki, April 17, 1895.		
Shashih	1896	73,000
Chungking		
Suchow	1896	500,000
Hangchow	1896	700,000
Gerard supplementary convention with France, June 20, 1895.		
Szema	1896	15,000
Under special article of treaty with Great Britain, February 4, 1897 (both on West river).		
Samshui	1897	4,000
Wuchow	1897	50,000
Opened by an imperial decree of March 31, 1898.		
Yo-chou .....	....	Unknown
Santua .....	....	Unknown
Chinwangtao .....	....	Unknown
Opened by imperial decree, April 7, 1898.		
Woosung .....	....	Unknown

Internal Navigation.—Besides the establishment of new treaty ports, another sign of progress in China was the opening of the inland waters to foreign commerce. In China the canals take the place of railways in other lands as a means of transit for internal trade. Throwing them open to foreigners removed one of the greatest obstacles to internal development. It was announced in February 1898, that the Chinese government had consented to admit foreign and native steamers to the inland navigable waters, and in the summer of that year the government issued the regulations which should govern the inland steam navigation. After stating that the inland waters of the treaty port provinces were open to small steamers, native or foreign, plying to treaty ports, the government laid down rules in regard to registration, revenue and the jurisdiction of the courts.

Education.—In the year 1898 there were also signs of progress in educational matters and it was expected that educational reforms of the greatest importance would be introduced. The Emperor issued a decree sanctioning the opening of a national university at Peking, and at the same time provided for the establishment of schools in the capitals of the provinces and in the department and district cities. It was expected that the curriculum at the University of Peking would be similar to that of the Japanese university and therefore pave the way toward a more progressive educational system. The cause of reform received a check in September when the Dowager Empress regained her control of the government and rescinded the reform decrees, but before the close of the year it appeared that she too was inclining toward progressive measures. While education is general among certain classes, there are large numbers of adults who cannot read or write, and even among the literati education is of a far too formal and unpractical character. Very crude notions prevail in regard to the natural sciences, but in recent years translations of western works of science have increased. There is a college of foreign knowledge at Peking with instruction in foreign languages, and elementary science is taught in the numerous mission schools at the various ports.

Finance.—The government does not publish the exact statistics of finance and the only available figures are those which are based upon estimates. The principal sources of revenue are the land tax, the customs duties, the salt duty and the *likin* on merchandise, and the chief branches of expenditure are the administration of the provinces, including the military establishments, the metropolitan administration, Manchu garrisons and imperial household. The collection of the duties on foreign goods is managed by the imperial customs department, the head of which is an Englishman, and a number of Europeans and Americans are employed as subordinates.

Army and Navy.—In 1898 some proposals were made for the improvement of the Chinese army, but no definite information as to what had been done could be procured, and it is probable that but slight changes had been made since the close of the war with Japan. Hitherto the best troops have been the Black Flags, who are said to number 50,000, and to be trained and equipped somewhat in the manner of European troops. A still larger force is the Eight Banner men, estimated at 300,000, and

the army of Manchuria, estimated at 180,000. Of these only a part were trained and equipped after European models. Besides these bodies are the Green Flags, with a nominal strength of 650,000. They are under the control of the local governors and have not been considered a particularly effective force. Their strength on a war footing is placed at 200,000. There is also a contingent force, the Tientsin Army Corps, with a paper strength of 100,000 of which perhaps 35,000 are effective. The nominal peace strength of the entire army is placed at 300,000, and its war strength at 1,000,000.

The great losses inflicted upon the Chinese navy by the war with Japan have not yet been repaired, although a few additions have been made to the fleet, including one torpedo cruiser, two protected cruisers, and several torpedo boats.

Government.—The head of the State is the Emperor by whom the supreme direction of affairs is entrusted to a Privy Council. Under the direction of the privy council the Nei-ko, or cabinet, controls the administration. The latter body is composed of four members, or ministers of state who control seven government boards; namely, the Board of Civil Appointments, of Revenues, of Rites and Ceremonies; of Military; of Public Works; of Admiralty; and the High Tribunal of Criminal Jurisdiction. There is also a Board of Censors, or Supervisors, which is in theory above the central administration. One of its members, of whom there are from 40 to 50, is to be present at the meeting of each board, and all have the right of remonstrating to the sovereign in regard to acts of administration. The Tsung-li-Yamen, or foreign office, has charge of foreign affairs and those branches of the administration in which foreigners are employed, as in the Maritime Customs, Peking University, etc. As to the local administration each province has a Governor, or Vice-Governor, who is responsible to the Emperor and is assisted by a council and other officials. Each province is divided into departments, and each department into districts.

HISTORY, 1898.

The Germans at Kiao-Chau.—In the autumn of 1897, there took place an event which looked like the first step in the partition of China. The murder of two German missionaries in the province of Shan-Tung led to a demand for reparation. The delay of the Chinese government in giving satisfaction prompted the German government to vigorous action. A naval force was sent to the port of Kiao-Chau on the western coast of the Yellow sea, and a body of marines about six hundred strong was landed there on November 15th, 1897. The Chinese garrison, though greatly superior in numbers, fled without offering resistance, and the Germans hoisted their flag over the fort. The other European powers made no protest against this action, but there was a general feeling of uneasiness in regard to Germany's intentions. It was thought that the murder of the missionaries was taken merely as an excuse for the seizure of Chinese territories,—that Germany had determined to have her share in the Celestial Empire, as an offset to the expected encroachments of Russia by way of Manchuria, and France by way of Tonquin. Negotiations followed between the German and Chinese governments, and in December 1897, a small German squadron was ordered to start for Chinese waters. Before the embarkation an imposing ceremony was had at which, in the presence of the chief officers of the State, the army and the navy, the Emperor made an address, encouraging those who took part in the expedition, and upholding the purpose for which it was undertaken. Prince Henry was placed in command, and the Emperor in the course of his speech dwelt on the great sacrifice he was making in sending his only brother to maintain the interests of Germany in those distant seas. The somewhat melodramatic character of the Emperor's speech provoked the ridicule of the press in other countries, for the expedition did not seem likely to be of an especially hazardous nature, and the fleet was not of an imposing size or character. Nevertheless, it was evident that Germany had embarked on a new and significant policy in regard to the far East. On Jan. 5, 1898, it was announced that the demands of Germany had been granted by the Chinese government. These concessions included a 99-year lease of the bay of Kiao-Chau together with the cession of a considerable tract of the surrounding land, as well as important commercial and industrial privileges in the adjacent territory. Like France in Tonquin, Great Britain in Hong Kong, and Russia in Manchuria, Germany was bound to secure for herself a naval base for the protection of her commerce in the East.

The Russians at Port Arthur.—Almost at the same time that Prince Henry was setting out on his pompously announced expedition, it was reported that Russia was making a move in the same game. It was rumored that a Russian fleet had occupied Port Arthur, at the mouth of the Gulf of Pechili, a point which is capable of being made the strongest fortress on the Chinese coast. Japan had seized this station at the close of the war with China, but had given it up under pressure from the three great powers, Russia, Germany and France. On March 28 it was announced

that Port Arthur and the neighboring city of Talien-wan, with its adjoining territory was ceded to Russia in usufruct for twenty-five years, with the privilege of extension. Russia also acquired the right of connecting these points with the main line of the Trans-Siberian railway. On the other hand she agreed to open a part of the harbor of Talien-wan to the merchant vessels of other nations, establishing there a customs tariff as in the treaty ports, but administered by Russian officials.

Concessions to the British.—At the close of the war between Japan and China, Russia and France guaranteed the Chinese loan for the war indemnity to Japan with the probable object of securing a sort of mortgage on parts of the Chinese Empire, which in the case of failure to pay the loan might be foreclosed with advantage. A portion of the war indemnity had already been paid off. Great Britain now offered to China a loan of £12,000,000 for the payment of the balance; but, though these terms were favorable, the Chinese government hesitated to accept them, influenced, it was said, by France and Russia. A purely British loan was not accepted, but early in March it was reported that a loan of £16,000,000 had been negotiated with the Hong Kong and Shanghai Bank (a British institution) and the German-Asiatic Bank. In the meanwhile Great Britain had demanded the opening of Talien-wan and two other places as treaty ports and the guarantee that no portion of the Yangtse-Kiang valley should be alienated to another power. Russia opposed the opening of Talien-wan, and, upon the representation of the Chinese government that insistence upon this point would involve it in serious difficulties, this demand was withdrawn.

But after the negotiation of the Anglo-German loan, it was announced that the following concessions to the British government had been made: The valley of the Yangtse-Kiang should not be ceded or leased to any foreign power; an Englishman should direct the administration of Chinese maritime customs as before; inland waters in China should be open to the ships of foreign nations; Great Britain to secure three new trading ports, Tu-ning, Chi-wang, and Fo-chan. When Russia was taking steps to secure Port Arthur it was understood that the British government would demand the island of Wei-Hai-Wei on the opposite coast of the Gulf of Pechili if Russia carried out her plan. After the cession of Port Arthur to Russia, Great Britain demanded Wei-Hai-Wei and the demand was granted, the convention ceding it being signed on July 1, 1898. Another important cession to Great Britain was the granting to her of a lease for ninety-nine years of the district surrounding Mirs bay in the neighborhood of Hong Kong. By this she gained a territory covering two hundred square miles and acquired control of the heights commanding Hong Kong, thus making that colony more secure against attack from the mainland of China.

Concessions to the French.—France also took part in the scramble for Chinese territory, and, in response to her demands the Chinese government, early in April, ceded to France a bay on the southern coast of China, permitted her to establish a railway line uniting Tonquin and Yun-nan-fou, guaranteed the non-alienation of Hai-nan and of the territory adjacent to Tonquin, and provided that a Frenchman should be appointed director of the imperial post.

British Criticism of the Government's Chinese Policy.—It is much too early to form an impartial estimate of Great Britain's policy in China, but some account of the discussion to which it gave rise is important as showing the popular attitude toward the matter. The news of a Russian occupation of Port Arthur at once caused great consternation in England, where there was a strong feeling that the traditional policy of the English required the maintenance of the entirety of the Chinese Empire. It was held that the interests of British trade would be seriously injured by the partition of China. Under the leadership of Sir Ashmead-Bartlett, the House of Commons voted that British interests required the maintenance of the integrity of China. It seemed to many that a combination against Great Britain had been made by the other powers for the purpose of injuring her interests in the East, and the reports of French and Russian intrigues to prevent the Chinese government from accepting the British loan strengthened this feeling. In spite of the substantial concessions made to Great Britain, many continued to criticise the government for what they considered its retrograde policy. They thought that with Great Britain's superior naval power, Russia's seizure of Port Arthur and Talien-Wan should have been prevented by an armed demonstration. They held that Russia had outwitted the British government and that her encroachment in this instance was but the initial step in a movement which would end in her absorption of the greater part of the Chinese Empire. For more than forty years, it was urged, the motive of the British policy had been the maintenance of the entirety and independence of the Chinese nation, with the ultimate aim of opening the trade of China to foreign nations on equal terms, and if this principle had not been expressly declared until recently, it was merely because it had not been called in question by other European powers. The rapid extension of British trade with China during the last twenty years had made this policy more than ever necessary, for it was seen

that foreign countries were constantly striving for exclusive markets, and trade on equal terms was not to be expected in their colonial acquisitions. It was in view of this aspect of the matter that a member of the government, Sir Michael Hicks-Beach, had said that Great Britain "did not regard China as a place for conquest or acquisition by any European power," that the country henceforth must be open to foreign trade and that the ministry was absolutely determined "even at the cost of war, that that door should not be shut."

In permitting the cession of Kiao-Chau and Port Arthur, it was said that the government had completely backed down. For a generation British statesmen had steadily opposed the designs of Russia on the Chinese coast and now she had been permitted to occupy Port Arthur, which has been called the "Gibraltar of the Far East." As an offset to this, the government cited a cession to Great Britain of Wei-Hai-Wei and other advantages, but of these things the opposition made light. As to the alleged inviolability of the Yang-tse valley, no importance whatever was attached to the statement of the Chinese government which was supposed to imply this. That government, it was said, merely declared that it could not contemplate the alienation of its territory to any foreign power. It had not given any formal guarantee in regard to it. And, although the British government referred to the promise of Germany and Russia that their acquisitions should be open to foreign trade, it was not believed that these countries would permanently pursue that policy. Thus the government had given up its old aim of maintaining the integrity of China, and the new policy of the "open door" would eventually share the same fate, for the predatory powers were protectionists in their colonial policy, and would inevitably shut the door when once they were securely in possession.

The British Government's Defense.—In answer to these objections it was urged that British interests were not in any way jeopardized by Russia's action. British dominion in the East was already wide enough. All that concerned her was to maintain her treaty rights and trading privileges. These were not violated by the concession to Russia, for the latter power expressly disclaimed any intention of hampering trade in the ceded districts. Her object in acquiring these districts was to obtain an outlet for the great Trans-Siberian railway, a project which when completed would greatly promote the trade of China with foreign countries. The attitude of the government had been warlike at first, but it soon took its stand on the principle that while it would not brook any aggressions likely to injure Great Britain's commercial interests, it had no objection to the mere fact of the acquisition of Chinese territory by other powers.

The discussion of the far eastern question in Great Britain covered a wide range, and included a great variety of projects for strengthening the British power in China. To some the partition of the Chinese Empire seemed inevitable, while others sharply criticised the government for its alleged vacillation and weakness in dealing with the matter. Among the plans suggested for adding to British influence in China was that proposed by Mr. Archibald R. Colquhoun in *China in Transformation*, 1898. His idea was that the land base in Burmah should be connected with the sea base in Hong Kong partly by railway, and partly by the navigation of the Yang-tse. He also believed that England must acquiesce in the partition of China and the principle of spheres of influence, but must see to it that her share of the divided empire should be the rich and populous valley of the Yang-tse.

Rival Railway Schemes.—The summer of 1898 was a period of strenuous diplomacy on the part of the representatives of the powers in China in connection with mining and railway concessions. The most important disputes had to do with the proposed railway to Niu-chwang and the Peking-Hankow or Lu-han railway. As to the former it was proposed that the Hong Kong and Shanghai Bank should issue a loan to the Chinese government for extending to Niu-chwang the already completed line that runs from Peking to Shan-hai-kwan by way of Tientsin. Russia opposed this on the ground that the road ran through the territory included within her sphere of influence. The Peking-Hankow project, though nominally under the control of the Belgians, was said to be really a Russian affair, and Great Britain objected to it on similar grounds to those taken by Russia in the case of the other road, viz.: that it passed through the Yang-tse region. The reports as to the negotiations are obscure but it would seem that the British felt that the ratification of the Peking-Hankow contract would bring Russia's influence into the Yang-tse valley, and since Russia was unwilling to see the British influence extend into the provinces bordering on her own frontier as would happen if the Niu-chwang line were negotiated, the British government felt justified in opposing the Peking-Hankow agreement. At one time it seemed as if war might result from this complication. The growing influence of Russia was said to be due to the friendship of Li Hung Chang and the latter was dismissed from office. This was taken as a sign of British ascendancy, but a palace revolution occurred soon afterwards and through the in-

fluence of the Dowager Empress, Li Hung Chang was restored. Nevertheless the firm tone taken by the British government resulted in a concession in regard to the extension of the line to Niu-chwang, although on certain conditions proposed by Russia. This partial triumph of British diplomacy was offset by the failure to prevent the carrying out of the Pekin-Hankow project. It will appear from this that progress was made toward the delimitation of spheres of influence in China. One of the characteristics of the struggle was the apparent coöperation from the first of Russians, French and Belgians, and the later tendency on the part of Great Britain, Italians and Germans to draw together. As a further sign that the idea of spheres of influence controlled the action of the powers in China it may be noted that the Germans prevented the concession to a Chinaman of a railway to Tientsin and Ching-Kiang on the ground that it was within the province of Shantung and that Germany should have the first right to build any line in that province. Later Germany and Great Britain formed an agreement in regard to this line by which that portion of it which was under German influence should be controlled by German officials while the portion within the Yang-tse region should be under British administration. Again, France opposed the building of a line from Canton to Kaulung, also urging the sphere of influence argument. Thus each of the great powers seemed to admit the principle of exclusive spheres of influence.

Lord Beresford in China.—Much was said in the press in regard to the mission of Lord Charles Beresford to China. He was sent out in August by the British Associated Chambers of Commerce and ostensibly his mission had no connection with the government and its chief objects were to inquire into the industrial and commercial condition of China with a view to promoting Anglo-Chinese trade. He, it will be remembered, was the naval officer who distinguished himself at the bombardment of Alexandria. From the fact that so energetic a man and one so well versed in military and naval affairs was chosen, it was thought by many that his mission had some connection with the government and had other ends than the development of Chinese trade. Nothing occurred within the year however to confirm this view. In his published interviews and speeches, he referred to the necessity of a firm and progressive policy in China including the reorganization of the Chinese army after European models, and declared that there should be an alliance of the great powers, Great Britain, Germany, the United States and Japan, to maintain the integrity of the Chinese Empire and the policy of the "open door."

The United States and the Eastern Problem.—It was to the interest of the United States that the rights guaranteed by treaties with China should be maintained. In general the attitude of this country was that it mattered not what powers gained Chinese territory so long as American rights were respected. The policy of the "open door" as supported by Great Britain was of course favored by the United States, but it was thought to be no concern of the latter to support the former power in warning off trespassers on Chinese lands. But the new interests in the East secured to the United States as the result of the war with Spain led many to call for a more active policy in regard to this matter, and it was urged in some quarters that the United States should range herself definitely on the side of Great Britain. (See the article of the UNITED STATES, paragraphs on History.) British writers and statesmen especially emphasized the good results of such a course, both to the United States and to Great Britain.

Continental Discussion of the Chinese Problem.—To Continental observers the issue of the Spanish-American war and the movement for an Anglo-American alliance seemed to have a very definite bearing on the eastern question. In fact the existence of that eastern question afforded, in the opinion of some, a just ground for the interference of Continental Europe to prevent the acquisition of the Philippines by the United States. A French writer pointing out that the Philippines commanded the sea route from Asiatic Russia, China and Japan, declared it was a matter of vital interest to Russia, Germany and France what became of them. He asked whether these three powers could permit the United States and England to put the keys of the Far East in their pockets on the false pretext of keeping open the door of Chinese commerce. As to the attitude of Great Britain in Chinese affairs, it seemed to Continental critics both weak and vacillating. They dwelt on the inconsistency of the British government in declaring itself at one time in favor of the integrity of China and then deliberately forcing China to cede Wei-Hai-Wei and the territory adjacent to Hong Kong. They pointed to that government's attitude in the Niu-chwang railway affair as a further sign of weakness. On account of the growing friendliness between the United States and Great Britain the reports published in our newspapers have generally reflected the more favorable views of the foreign powers on the subject. French comment has on the whole been anything but favorable. It abounds in criticisms and sneers—criticisms of the futility of the means which Great Britain has employed to secure her ends, and sneers at the spirit of selfishness which seemed to these writers to direct her whole policy. French sympathy was naturally

with Russia. French writers made light of Lord Salisbury's declaration to the House of Lords on the first of August that Sir Claude Macdonald, the British minister to Peking, had been authorized some days before to say to the Chinese government, that if any foreign power should attack China she could count on the material aid of Great Britain, to which statement the Peking government replied, with thanks to Lord Salisbury, that no foreign power was attacking it. Much unfavorable comment was occasioned by a speech of Mr. Chamberlain's in which, referring to the diplomatic contest with Russia in China, he applied to the case the proverb that a man needs a long spoon who supps with the devil. The chagrin which Li Hung Chang's return to power seemed to cause those British writers who a short time before had hailed his dismissal as a diplomatic triumph for their country, gave a somewhat malicious pleasure to the French. The return of Li Hung Chang was generally viewed as marking the success of the Russian diplomacy. To the countries on the continent Russia seemed to have the best chance of securing a preponderant influence in China, for, it was said, Great Britain's vast naval power would not avail her against China. As to operations on land Russia had a decided advantage from her situation. With a numerous army on the frontier ready to march to Peking and with railroads already nearly completed, making the mobilization of troops an easy matter, Russia in case of war would have everything in her favor. Yet war did not on the whole seem imminent. Some arrangements for the dismemberment of the Chinese empire appeared more probable. If England were defeated in her diplomatic conflict at Peking, it was thought that she would avail herself of the elements of disorder and the hatred of the existing dynasty which had made their appearance in the Yang-tse valley. It would be easy for her to take advantage of the disaffection of the population in this vast and fertile region to stir up revolt against the dynasty and would be easier still if the reported plots of the Dowager Empress proved true.

Court Intrigues.—In August and the first part of September events seemed to indicate the determination of the British government to regain its influence in China and to offset that of Russia. Toward the close of September it was rumored that a palace revolution or *coup d'état* had taken place, with the probable result of reversing the progressive policy that had recently characterized the Chinese government. It appeared that the Emperor Kwang-su, had surrendered the reins of government to the Dowager Empress. This was followed in rapid succession by reports that he was physically unable to discharge the duties of his office, then that his health was failing rapidly and still later that he had committed suicide. The report of his death proved afterwards to be untrue but it gave rise at the time to the suspicion that the Dowager Empress had caused his removal by foul means, and her career was widely discussed in the press, where she was compared to Catherine de Medici and Lucretia Borgia from the rapid and successful way in which she had cleared from her path all rivals to her ambition. She was one of the secondary wives of the Emperor Hien-Fung, who died in 1861. During the minority of his successor all power was in the hands of the late Emperor's principal widow and herself, and when the young Emperor in 1874 began to show an inclination to be something more than a king in name, he failed completely in the attempt to assert his authority and died soon afterwards under suspicious circumstances. The imperial throne was again filled by a minor and after 1881 when the then Dowager Empress met her death also under suspicious circumstances, the present Dowager Empress became the sole ruler. Even after the majority of the young Emperor Kwang-su in 1889, it is said that her influence continued to direct the court. Li Hung Chang, whose sympathies were wholly with Russia and whose policy was in general retrogressive, was the chief minister of the Dowager Empress. On the other hand the Emperor was inclined to introduce reforms and profit by the example of western civilization. His adviser was the reformer Kang-Yu-Wei, to whose influence is said to be due the more open-minded attitude of the Chinese towards foreign trade and internal improvements. Early in the autumn it became known that Li Hung Chang had been reinstated and that the progressive minister, Kang-Yu-Wei, had been discharged. The secrecy surrounding the doings of the Chinese court made it impossible to obtain any authentic account of these matters. It was evident, however, that a reactionary spirit now controlled the government. The Emperor publicly announced that the direction of affairs would be entrusted to the Dowager Empress and some of the reforms which he had started were checked. Nevertheless, before the close of the year there were signs that the Empress Dowager herself was inclining toward the more progressive policy, having found perhaps that the pressure compelling her in this direction was too strong to be resisted.

The Yang-tse Region.—The Yang-tse valley comprises the six provinces of Szechuen, Hupeh, Hunan, Kiangsi, Anhui and Kiang-Su, with a population estimated at from 70,000,000 to 90,000,000. According to the terms of the Chinese agreement with Great Britain it was merely stated that the Chinese government could not contemplate in any event the alienation of any portion of the Yang-tse valley to a foreign power. Outwardly the British government merely desired to prevent that

region from falling into the hands of a rival nation, but to many Englishmen this promise of the Chinese government seemed a hopeful sign that eventually Great Britain would exercise a protectorate over the Yang-tse valley. It was said that while this would not be done hastily it would come about through the necessity of keeping the region from falling into foreign hands, that the English would occupy the country as they had occupied Egypt, in order to keep others out, and that when once there they would remain. This it was thought would be easily accomplished for a number of reasons. In the first place there was a spirit of dissatisfaction in the provinces of the Yang-tse with the Peking government. In fact there was reported to be a movement for the setting up of an independent kingdom in the Yang-tse valley with its capital at Nanking. One cause of the dissatisfaction on the part of the viceroys of this province was the turning over of the *likin* or inland customs revenue to the Anglo-German banking syndicate as a guarantee for the loan above mentioned. The viceroys had depended largely on this source of revenue for the expenses of administration as well as their personal remuneration. Thus there is no patriotic desire in these regions to maintain the integrity of the Empire. A fact in regard to China which is commonly overlooked is that the people are not homogeneous but seem to be scarcely conscious of national identity. The people of some provinces cannot understand the language spoken in others and there is little sympathy between the different branches of the race. It has been said that the goal toward which China is tending is federalism and that even now the provincial governments are more independent in their respective spheres than the States of the American Union. The bearing of this on the question of the partition of China, if that question shall press for solution, is obviously important.

Internal Disturbances.—The latter part of the year was marked by numerous popular outbreaks which were mainly directed against foreigners. The most threatening of these was in the province of Kwans-tse, formerly the seat of the Tai-ping rebellion, whence it spread to adjoining provinces. The secret society of the Triads, which had been prominent in the Tai-ping rebellion is said to have been active in this revolt. Insurrections broke out in other parts of the country resulting in damage to the property of foreign missionaries. At Peking, when the reactionary party gained the upper hand, their triumph was marked by riots in the streets and attacks upon the members of the British and American legations, and upon American missionaries. The government promptly apologized for these outrages, but they continued in several parts of the Empire throughout the rest of the year. In some quarters a general revolution was feared. After the palace revolution above mentioned, some of the officials who had shown sympathy with the reform movement, were executed, and others were banished or degraded. It was found necessary to land bodies of Russian, British, German and French marines, which were sent to the capital to protect the interest of the legations.

Railway Concessions.—In so far as the competition between foreign concessionaries threatened to affect international relations, a brief reference to recent railway grants has been made in a preceding paragraph. It remains to notice these and other concessions in their bearing upon the economic development of China and the opening up of the country to foreign capital. During 1897 and 1898 many new railway projects were sanctioned and much was accomplished toward the carrying out of those already undertaken. By the beginning of 1898 the railway mileage which was actually completed was very small. On June 30, 1897, the railway from Tientsin to Peking, a distance of seventy-three miles, was open to traffic. In the fall of 1897 it was expected that Russia would complete her Trans-Siberian line in a few years. At that time the first instalment on the loan for a railway from Shanghai to Nanking was completed and surveys on the road had already been made. When these points are connected the line will be pushed on in a short time to Hanchow, and later this point will be joined to Peking. When the Trans-Siberian line joins the Chinese railways, as is expected, there will at last be railway communications between China and Europe. Foreign capitalists have been active in their efforts to secure railway concessions. It was reported in the spring of 1898 that Germans had obtained the right to construct a railroad to Ichow-Fu and thence to Shanghai in addition to a railway connecting Kiao-Chow with Chinan-Fu. Our minister to China, writing under date of June 16, 1898, reports a railway concession to the Russo-Chinese Bank for a line 140 miles long connecting the capital of the Shansi province with Cheng-Ting-Fu in the province of Chihli. He also reported that a line from Hankow had been granted to an American syndicate. The railway originally built to connect Kaiping with deep water on Petang river, has been extended beyond Tientsin. The Manchurian railroad, of which so much has been said in the newspapers in connection with Russia's schemes for aggrandizement, is to start from Onon on the Transbaikal section of the great Siberian railroad and after passing through Manchuria is to connect with the South Ussuri railway at Nikolsk. Its length will be twelve hundred and seventy-two miles, of which nine hundred and forty-five miles will lie in Chinese

territory. This railway concession was the result of a convention between Russia and China formed in the summer of 1896, and the object of the Russians in building this line is said to be not only the promotion of trade between Russia and China, but the strengthening of coast defences. According to the terms of the concession Russia is to build the road at her own expense and to retain control for thirty years, at the end of which time China may purchase the line if she wishes. The Hankow-Pekin line mentioned above was conceded to a Belgian syndicate in return for a loan. The contract was signed on June 26, 1898, and its text is given in the United States Consular Report for November of that year. The railway is a Belgian project, and its construction is to be under Belgian management. It has long been the desire of the more progressive officials in China to connect Peking with Canton by rail, and the building of a line to Hankow, which is half way between Peking and Canton, is a long step toward the realization of that plan. In the absence of funds and of the fit men to carry out the work in China, the government had to look to outsiders, and of foreign nations Belgium seemed the most suitable because of its neutrality and the improbability of its using its advantages for purposes of conquest. For a long time the Belgian representative carried on negotiations at Peking, and at last the contract was awarded. A Chinese loan bearing interest at 5 per cent. was negotiated by the Belgian syndicate, which called in the assistance of French capitalists. The Russo-Chinese Bank was appointed as the financial agent. The rumor that the greater portion of the money was to be subscribed by Russian capitalists led to the alarm of the English and evoked the protest already mentioned. It was provided that the board of managers should be at least two-thirds French or Belgians and that the remaining one-third might be Chinese. It is required to be completed by 1903, and its length is to be seven hundred miles. Among the other important railway projects are the continuation of this line to Canton, the building of a line to Shanghai, to Soochow and Hangchow, and the continuation of the Northern railway to Kirin and Moukden. In this last-named project Russia is to assist if China finds it beyond her financial strength. Some advance has been made also toward the introduction of electric railways. In Shanghai bids were requested in the summer of 1898, for a line about eighteen miles long, based on the overhead wire and trolley system, and a concession was to be given to a syndicate, the franchise running from thirty to fifty years, according to the amount paid by the company to the city government.

The Shansi and other Concessions.—The following statement is quoted from the report of the United States Consul in regard to the Shansi concession, which he describes as the first concession ever made by the imperial government to a foreign syndicate of the right to open and work mines, and build and operate railways, independent of Chinese control: "On the 21st of May 1898, there were signed, in the presence of the ministers of the Tsungli Yamen, articles of agreement which ceded to the Peking Syndicate, Limited, of London, the sole right to open and work the coal and iron deposits of central and southern Shansi and the petroleum deposits of the entire province; also, the right to construct and operate all necessary railways to main and trunk lines and navigable waters for exporting the mining products. This agreement was signed by order of imperial edict, stamped with the seal of the Tsungli Yamen as a visible sign of imperial sanction and authority, and the whole proceedings were verified and ratified by the British and Italian ministers to China. The signing of this contract marks the most important epoch in the industrial policy of China. The precedent has been established of allowing foreigners, for commercial purposes, to own real estate in the interior of China, open and operate mines, and construct and maintain railways. There have been many so-called mining concessions granted in China, but not one of them is worth the paper it is written on. Of the railway concessions, only one—the Belgian Syndicate for the Peking-Hankow Railway—has gotten beyond the preliminary stage, and in none is the syndicate more than the financial agent of the Chinese. These railway syndicates have no voice in the management and not too much security for their money. As a matter of fact, up to date neither the Belgian Syndicate nor any other syndicate has furnished one cent of money."

Then follows a synopsis of the terms of the agreement, according to which the board of directors of the syndicate is to have control of the entire administration. As to the returns to the Chinese government, it is provided that a 5 per cent. producer's tax on the actual cost of extracting coal, iron or other material shall be paid to it together with 25 per cent. of the net profit after the syndicate has received 6 per cent. interest and set aside 10 per cent. as a sinking fund with which to repay capital. As to the resources of the region included in this grant, the consul reports: "The province of Shansi lies to the west of Chihli. It consists of an interior plateau of 3,000 feet elevation, more or less cut up by rivers. This plateau is bounded on all sides by mountains rising to 8,000 and 14,000 feet above the sea. In some places, these ranges have been cut through by rivers: but in all parts they are rugged, and transportation must be effected by pack mules or camels. In the eastern

portion of the province, and running into the province of Honan, are deposits of anthracite coal. The western half has bituminous coal covering some 12,000 square miles and all along the western boundary are deposits of petroleum. At many different points in the coal region are deposits of rich iron ore. The coal strata are practically horizontal, and at an elevation of about 2,500 feet. They show wherever erosion has cut to a sufficient depth. This anthracite-coal vein is unbroken over an area of 13,500 square miles, and its thickness varies from 25 to 50 feet, an average of 40 feet. All this deposit is within the limits of the concession. There are thousands of native coal mines now in operation, and the coal has been used for probably three thousand years. The iron ore is now worked by the natives. This entire region has been examined by William H. Shockley, mining engineer, and Charles D. Jameson, civil engineer, both Americans and in the employ of the syndicate. There is probably no coal field known in the world that can compare with this of Shansi, either in quality or quantity of coal or the possibility of cheap production.

"In addition to the concession in Shansi, there was signed on the 21st of June an identical agreement ceding to the Pekin Syndicate all of that portion of Honan north of the Yellow river (about 10,000 square miles) and another agreement by the terms of which all of the mountainous part of Honan south of the Yellow river is ceded to the Syndicate as soon as work is begun on the Shansi concession. The total area of these concessions is 71,000 square miles, equal to England and Scotland."

CHITRAL. See INDIA (paragraphs on History).

CHOATE, JOSEPH HODGE, one of the leaders of the New York bar. was born in Salem, Massachusetts, in 1832; was graduated at Harvard, 1852, and after passing two years in the Law School of that institution and a year in a Boston law office he was admitted to the Massachusetts bar, 1855. The next year he came to New York City and has lived there since that time. After a year passed with Scudder and Carter, he entered the office of Butler, Evarts and Southmayd, and in 1859 became a member of the firm of Evarts, Southmayd and Choate; he soon became well known in the profession. The present law firm is Evarts, Choate and Beaman. From 1865. Mr. Choate has been connected with many of the most important cases tried in New York; among them may be mentioned the investigation of the case of Gen. Fitz John Porter, the Tweed ring prosecution, the Tilden will contest, the controversy over the fortune of Commodore Vanderbilt, the Chinese Exclusion Act, the suit of David Stuart vs. Collis P. Huntington, the Behring Sea dispute, the arguments on the constitutionality of an income tax, the case of Laidlaw against Russell Sage. Mr. Choate has never before held public office, but his political career began when he took the stump for John C. Fremont in 1856. He has always been a Republican, but in general opposed machine management and on this account has frequently been at odds with the leaders. He was president of the New York State constitutional convention in 1894, and two years later was a candidate for United States senator. He was president of the New England Society, 1867-71, of the Union League Club, of New York City, 1873-77, and of the Harvard Club, 1874-78. Toward the close of the year 1898 Mr. Choate's appointment as successor to Mr. John Hay, as ambassador to the Court of St. James was strongly advocated. He is recognized as a man of upright character and unusual ability and his appointment met with general approval.

CHOLERA. See PUBLIC HEALTH.

CHOSEN FRIENDS, ORDER OF, a fraternal society, dating from 1879, with two grand councils, 570 subordinate councils, and 23,133 members. Since its organization it has disbursed \$12,201,893, and \$831,898 during the last fiscal year. H. H. Morse, New York, Supreme Councillor; T. B. Linn, Indianapolis, Supreme Recorder.

CHRISTADELPHIANS, THE. The report of this sect for 1898 gives 63 churches and 1,277 members, showing an increase over 1890.

CHRISTIAN AND MISSIONARY ALLIANCE, formed in 1897 by the union of the Christian Alliance and the International Missionary Alliance; the objects are "the promotion of a deeper and higher Christian life, and the work of evangelization especially among the neglected classes." The receipts for 1897, were \$262,000. Missionaries were sent to Arabia, India, Thibet, China, Palestine, Japan, the Congo, the Soudan, and South America. Its organ is the *Christian Missionary Alliance*.

CHRISTIAN CATHOLIC CHURCH, was organized in Chicago, February 12, 1896. Among its beliefs is triune baptism. The church has 20 elders, 6 evangelists, 2 deaconess missionaries in India, 3 deaconess missionaries in America, 11 deacons, and one general overseer, the Rev. John Alexander Dowie. Congregations have been established in France, England, India, British Columbia, Africa, and Australia, as well as in Iowa, Ohio, Michigan, Illinois, Pennsylvania, Wisconsin, and Indiana. Zion Seventies, under the leadership of elders and evangelists, and Zion Junior Seventies have been organized. There were 2,000 baptisms during the year

1898. Altogether there are about 200 meeting-places and about 14,000 members. Divine Healing Homes have been established in various places, and about 750,000 copies of *Leaves of Healing* have been circulated. The latest report of the commissioner of education shows that the Christian Catholics have in the U. S. 17 institutions of higher education, with 152 teachers, 1,445 students, and endowment funds of \$716,309.

CHRISTIAN CONNECTION, or Christians (seceding Methodists). At the Quadrennial meeting of 1898, the union with the Christian Church, South, was consummated and arrangements were made for mission work among the Armenians. The Christian Connection was active in church building and generous in missionary offerings, there are 1,424 churches, 1,391 ministers, and 107,868 communicants of the Christian Churches, South, making a total of 1,598 churches, 1,493 ministers and 124,368 communicants.

CHRISTIAN ENDEAVOR. See UNITED SOCIETY OF CHRISTIAN ENDEAVOR.

CHRISTIAN SCIENTISTS (more properly called the Church of Christ, Scientist), a denomination of professing Christians founded in 1866 by Mary Baker Eddy. They believe that sickness and evil are only the creations of the imagination and can be removed by prayer. The principles of the cult are defined in Mrs. Eddy's text book, *Science and Health*. In 1898 the number of persons attending the churches of this denomination more than doubled, a Christian Science board of education was established in Boston and an international board of lecturership of the mother church, consisting of 11 residents of the United States, which gives an elaborate system of public lectures; and a new periodical, the *Christian Science Journal* was begun. The number of churches in 1898 was 415, of ministers 10,000 (an increase of 6,500 over 1897), and communicants 70,000 as against 40,000 in 1897.

There are six regularly organized churches in New York City, three of which have buildings, and the Second Church of Christ, Scientist, is erecting a building at Central Park, West, and Sixty-eighth street. The mother church is in Boston (1,400 members). The Christian Science Publishing House is also in that city, and, in addition to books and pamphlets, issues *The Christian Science Monthly Journal*, *The Christian Science Weekly*, and the *Christian Science Bible Lessons*. Besides the churches, there are 11 Sunday schools, which form the beginnings of new organizations, and 85 public Christian Science reading-rooms in various cities. The growth of the Christian Science movement has been great in England, Germany, Italy, France, Norway, Sweden, South Africa, and Japan.

Towards the end of 1898 much publicity was given to the Christian Scientists both in England and in America; in the former on account of the unsuccessful treatment and death of the noted journalist, Mr. Harold Frederic (q. v.) whose Christian Scientist attendants were subsequently prosecuted by law on the charge of manslaughter, a coroner's jury bringing in a verdict declaring the attendants, Miss Kate Lyon and Mrs. Athalie Mills, criminally responsible for Mr. Frederic's death.

In America cases like the following have been numerous: In Tacoma, Wash., a leader of the Christian Scientist Church died of acute pneumonia after having refused medical attendance and having entrusted the treatment of his disease to the care of a woman in Savannah, Ill., in whose power to cure him even over that great distance he firmly believed. In Cincinnati a man died of typhoid fever refusing any assistance except the prayers and asseverations of his Christian Scientist healer. The "healer" was held for manslaughter, but a decision of the court of common pleas held that the rites performed were in nature religious and not medical and therefore not subject to the State law regarding registration of all who practice medicine. In the same city, however, a month later, a Christian Scientist healer was fined for violating this same law. In Omaha, Neb., a woman died of burns for which she would do nothing that was not prescribed by the Christian Scientists.

The Christian Scientists say, however, that undue attention has been given to the unsuccessful cases which occur indeed in the practice of even the most skillful medical practitioners; and they claim that 70 per cent. of the cases undertaken by them are cured. Their practices should not be confused with the so-called "mind cure," "faith cure" or with the use, as therapeutic agent, of Hypnotism (q. v.).

CHRISTIAN UNION CHURCHES, are composed of the Christian Connection (q. v.), and the Christian Church South, the latter consisting of 102 ministers, 174 churches, and 16,500 members. The Christian Union Church reports for 1898 183 ministers, 294 churches, and 18,214 members. The Disciples of Christ (q. v.), also call themselves Christians.

CHURCH TEMPERANCE LEGION, under the supervision of the Church Temperance Society (q. v.), consists of the Knights of Temperance, Young Crusaders, and Veteran Knights. Its object is to encourage temperance among boys and

men. President, Col. B. F. Watson; secretary, Rev. Melville K. Bailey; headquarters the Church Mission House, New York. The Womens' Auxiliary consists of Mrs. George S. Bowdoin, president; Mrs. Irving Grinnell, vice-president; Mrs. Charles Townsend, treasurer; and Miss H. D. Fellowes, and Miss H. K. Graham, secretaries.

CHURCH TEMPERANCE SOCIETY, organized in 1881, within the P. E. Church, admits those who use liquor in moderation as well as those who abstain. Its motives are to encourage temperance in the young, to rescue drunkards, to restrict the saloons by legislation, and to establish reading-rooms, coffee-houses, working-men's clubs, etc. Officers (1899): President, Rt. Rev. John Williams, D. D., Bishop of Connecticut; vice-president, sixty bishops; chairman, Rt. Rev. W. C. Doane, D. D., Bishop of Albany, vice-chairman, Rev. C. De W. Bridgeman, D. D., treasurer, Irving Grinnell; general secretary, Robert Graham. See the article **CHURCH TEMPERANCE LEGION**.

CIVIL ENGINEERS, AMERICAN SOCIETY OF, founded in 1852, has 2,117 members. The meetings are held monthly at the society's home 220 W. Fifty-Seventh street, New York. President, Alphonse Fteley; secretary, Charles Warren Hunt.

CLAIRVOYANCE. See **PSYCHICAL RESEARCH, SOCIETY FOR**.

CLARK, LATIMER, English electrician and inventor, was born at Great Marlow, March 10, 1822, and died October 30, 1898. Among his many inventions may be mentioned the following: The double bell insulators for telegraph wires and the device for protecting steel telegraph cable, both now in general use; the pneumatic system for transmitting telegrams through pipes; Clark's Standard Cell. In 1861 he proposed the names and the system of volts, ohms, farads, etc., now generally adopted. As a partner of Messrs. Forde and Taylor he superintended the laying of more than 100,000 miles of submarine telegraphic cable in various parts of the world. He was a member of the Institute of Civil Engineers and fourth president of the Institute of Electrical Engineers, a fellow of the Royal Society and of the Royal Astronomical Society, and a chevalier in the Legion d'Honneur. He was partner in a large hydraulic engineering firm. His published writings include: *A Description of the Britannia and Conway Tubular Bridges* (1850); *A Treatise on Electrical Measurement* (1868); with Sabine, *Electrical Tables and Formulae* (1871); *Dictionary of Electrical Measures* (1891).

CLARKE, MRS. MARY VICTORIA COWDEN, the well known Shakespearean commentator, died in Genoa, Italy, January 12, 1898. Born in June 1809, she was one of the very few remaining links that joined the social and literary life of the last part of the century to that of the earlier part which was marked by such a galaxy of literary lights. Daughter of a musician and publisher, wife of an author, and friend of some of England's greatest writers, she seems to have gathered up and reflected both the wise brilliancy and the wise kindliness which devotion to literature and art alone can give.

CLAY. The enormously increased use of this material, has led many State geological surveys to publish special reports on the deposits of clay within their boundaries. Among these may be mentioned one issued by the State College of Pennsylvania, and treating of the fireclays of the State; a second one on the clays of North Carolina issued by the North Carolina Geological Survey, and a third on the clays of northwestern Indiana.

The latest statistics are those for 1897 which give the production as follows:

Common Bricks.....	\$26,353,904
Pressed Bricks.....	3,931,336
Paving Bricks.....	3,582,037
Firebricks	4,094,704
Drain Tile	2,623,305
Sewer Pipe.....	4,069,534
Terra Cotta.....	1,701,422
Fireproofing	1,979,259
Floor Tile.....	1,026,398
Miscellaneous	1,413,835
Pottery	9,450,859
	<hr/>
	60,911,641

CLEARING HOUSE. See **UNITED STATES**.

CLEARY, Most Rev. JAMES VINCENT, archbishop of the Roman Catholic diocese of Kingston, Ontario, died at Kingston, February 28, 1898. He was born in Dungarvan, Waterford, Ireland, September 18, 1828; came to Canada in 1880 as bishop of

Kingston and was made archbishop in March 1889. The Liberal settlement of the Manitoba school question was vigorously opposed by him.

CLEMENCEAU, Dr. GEORGES, a well-known French Radical politician and journalist, prominent in 1898 in connection with the Dreyfus case (See FRANCE, paragraphs on History), was born in 1841. He was the author of a number of forcible articles in the *Aurore*, demanding revision of the Dreyfus case, and appeared in the trial on the side of Zola. One of his articles on the trial led to a duel between him and M. Drumont, of the *Libre Parole*, in which neither combatant was injured.

CLIMATOLOGICAL ASSOCIATION, AMERICAN, organized in New York, September 1883, for the study of diseases of the respiratory organs, together with the influence of climate thereon. Next annual meeting in New York City, in May 1899. President, Beverly Robinson, M. D.; secretary, Guy Hinsdale, M. D., Philadelphia, Pa.

COAL. The production of coal in the United States was: 1897, 200,259,654 short tons; 1898, 208,952,502 short tons. This shows an increase of 4.3 per cent. and is the greatest production known in the United States. The advance was due chiefly to an increased production of bituminous coal, as the anthracite output remained about the same. Pennsylvania was not only the largest producer of anthracite, but furnished more than half the coal mined in the United States in 1898. Illinois was second in the list of coal-producing States, but was somewhat crowded by Ohio and West Virginia the latter being third, becoming not only an important producer but also a successful competitor of Pennsylvania and Ohio, both in the Chicago market and also in the Great Lakes trade. The recent explorations of the United States Geological Survey, have developed beds of coal at numerous localities in Alaska, but comparatively few of them are being worked. During 1898, several hundred tons of bituminous coal were mined on Admiralty Island, but besides this little more than exploitation work had been done. The Kansas University Geological survey has just issued a report on the coal of that State, in which it is stated that the coal-bearing formations underlie nearly a fourth of Kansas. The western limit of this area is definable by a line drawn from the north boundary of the State 25 miles northwest of the Missouri river, southwest to the southern boundary, at a point 125 miles west of the Missouri line. The coal bearing strata are from 2,000 to 2,500 ft. thick, this latter thickness being found in the southern portion of the State. The best coal beds are found in the Cherokee shale, and the belt of these extends from the Weir-Pittsburg locality to Fort Scott, and thence to Leavenworth. The quality of Kansas coal is considered superior to much that is found further west, and the total output for 1898, is estimated at not less than 4,000,000 tons. West Virginia is becoming an important competitor with Pennsylvania in the coal markets, and during 1898, its influence has been felt, much of the output having been sent to Chicago, and also for shipment on the Great Lakes. Much West Virginia coal was used by the United States fleet during the recent war, that from the New River and Pocohontas fields, being considered especially desirable, owing to its low amount of ash and sulphur, high percentage of fixed carbon, and the fact that it is incapable of spontaneous combustion. The export trade in coal for the first ten months of 1898 amounted to 3,782,671 tons, most of this going to Canada and South America. The imports were 1,076,888 tons, and included mostly shipments from Australia to California. An important development in the coke trade has been the increasing use of by-product coke ovens, and the tendency of many iron works to coke their own coal.

COCHIN CHINA is the name applied to the eastern part of the peninsula of Indo-China and loosely identified with the former empire of Anam (q. v.). The present use of the term, however, applies to what is properly called Lower Cochin China which lies at the southern extremity of the eastern portion of the Indo-China peninsula and stretches from Cambodia and Anam on the N. N. E. to the China Sea and the Gulf of Siam. The area is generally given at something over 23,000 square miles, and the population according to estimates of 1897 was 2,034,453, of whom the Anamites were the chief element, but there were also Chinese, Cambodians, Malays, and Malabarians. The French settlers numbered 4,335. The people are mainly engaged in agriculture and the chief crop is rice, of which a great quantity is regularly exported to China, Java and Europe. Other articles of export are cotton, hides, fish, pepper and copra. There has been considerable progress in recent years under the French administration. Post-offices have been established, railway and telegraph lines constructed and the work of education carried on with activity. Along with Anam, Cambodia and Tonquin it forms French Indo-China. See **INDO-CHINA**.

COCHRANE, GENERAL JOHN, New York lawyer and politician, died in New York City, February 7, 1898. He was born at Palestine, New York, August 27, 1812; was graduated at Hamilton College in 1831 and three years later was admitted to the bar; he was surveyor of the port of New York, 1853-57, and from the latter date to

1861 represented the Sixth district in Congress. In the Civil War he commanded the First United States Chasseurs, became in July 1862, brigadier-general of volunteers in the Army of the Potomac, but on account of ill health resigned in February of the following year. For two years he was attorney-general of New York; in 1872 he was a delegate to the Democratic convention at Cincinnati, which nominated for the presidency Horace Greeley, whom General Cochrane vigorously supported; in the same year he was made president of the New York Board of Aldermen. During the temporary retirement of Mayor Hall, at the time of the Tweed scandal, he acted as mayor of the city. He was a Republican member of the Board of Aldermen in 1883, but the next year returned to Tammany Hall and became a sachem of the society.

COINAGE. See UNITED STATES and the articles on foreign countries.

COINS, VALUE OF, FOREIGN. The following tables show the official valuations of foreign coins by the United States' Treasury; 1st, in the case of countries with fixed currencies; and, 2nd, in the case of countries with fluctuating currencies giving the quarterly valuations of the latter from January 1st, 1898, to January 1st, 1899.

A.—Countries with fixed currencies.

Countries.	Standard.	Monetary unit.	Value in U.S. gold	Coins.
Argentine Republic*..	Gold and silver	Peso	\$0.96,5	Gold—Argentine (\$4.82,4) and $\frac{1}{2}$ Argentine; silver—peso and divisions.
Austria-Hungary†	Gold	Crown.....	.20,8	Gold—20 crowns (4.06,2) and 10 crowns.
Belgium	Gold and silver	Franc .....	.19,8	Gold—10 and 20 franc pieces; silver—5 francs.
Brasil	Gold.....	Milreis .....	.54,6	Gold—5, 10, and 20 milreis; silver— $\frac{1}{2}$, 1 and 2 milreis.
British North America (except Newfoundland).	....do.....	Dollar.....	1.00	
British Honduras .....	....do.....	....do.....	1.00	
Chile.....	....do.....	Peso.....	.86,5	Gold—escudo (\$1.25), doubloon (\$3.65), and condor (\$7.80); silver—peso and divisions.
Costa Rica.....	....do.....	Colon.....	.46,5	Gold—2, 5, 10, and 20 colons; silver—5, 10, 25, and 50 centismos.
Cuba	Gold and silver	....do.....	.92,6	Gold—doubloon (5.01,7); silver—peso (60 cents).
Denmark	Gold	Crown .....	.26,8	Gold—10 and 20 crowns.
Egypt.....	....do.....	Pound (100 piasters).	4.94,8	Gold—10, 20, 50, and 100 piasters; silver—1, 2, 10 and 20 piasters.
Finland.....	....do.....	Mark .....	.19,8	Gold—10 and 20 marks (\$1.98 and \$3.85,9).
France.....	Gold and silver	Franc .....	.19,8	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Germany.....	Gold.....	Mark .....	.23,8	Gold—5, 10, and 20 marks.
Great Britain .....	....do.....	Pound sterling	4.86,64	Gold—sovereign (pound sterling) and half sovereign.
Greece	Gold and silver	Drachma.....	.19,8	Gold—5, 10, 20, 50 and 100 drachmas; silver—5 drachmas.
Haiti .....	....do.....	Gourde .....	.96,5	Silver—gourde.
Italy .....	....do.....	Lira .....	.19,8	Gold—5, 10, 20, 50, and 100 lire; silver—5 lire.
Japan ‡.....	Gold	Yen .....	.49,8	Gold—1, 2, 5, 10 and 20 yen.
Liberia .....	....do.....	Dollar.....	1.00	
Netherlands.....	Gold and silver	Florin.....	.40,2	Gold—10 florins; silver— $\frac{1}{2}$, 1 and 2 $\frac{1}{2}$ florins.
Newfoundland	Gold	Dollar.....	1.01,4	Gold—\$2 (\$2.02,7).
Portugal .....	....do.....	Milreis	1.08	Gold—1, 2, 5 and, 10 milreis.
Russia .....	....do.....	Ruble .....	.61,5	Gold—imperial (\$7.71,8) and $\frac{1}{2}$ imperial (\$3.80); silver— $\frac{1}{2}$, $\frac{1}{4}$, and 1 ruble.
Spain	Gold and silver	Peseta .....	.19,8	Gold—25 pesetas; silver—5 pesetas.
Sweden and Norway..	Gold	Crown.....	.26,8	Gold—10 and 20 crowns.
Switzerland.....	Gold and silver	Franc.....	.19,8	Gold—5, 10, 20, 50 and 100 francs; silver—5 francs.
Turkey	Gold	Piaster .....	.04,4	Gold—25, 50, 100, 200, and 500 piasters.
Uruguay	Gold	Peso.....	1.08,4	Gold—peso; silver—peso and divisions.
Venezuela	Gold and silver	Bolivar	.19,8	Gold—5, 10, 20, 50 and 100 bolivars; silver—5 bolivars.

* In 1874 and 1875, the gold standard prevailed.

† The gold standard was adopted October 1, 1892. Values are still, however, frequently expressed in the florin or gulden, which is worth 2 crowns or 40.6 cents.

‡ Gold standard adopted October 1, 1897.

B.—Countries with fluctuating currencies.

Countries.	Monetary unit.	1898.				1899.
		Jan. 1.	April 1.	July 1.	Oct. 1.	Jan. 1.
Bolivia.....	Silver boliviano ..	\$0.42,4	\$0.40,9	\$0.41,8	\$0.43,6	\$0.43,9
Central America	Silver peso .....	.41,4	.40,9	.41,8	.43,6	.43,9
	Amoy tael.....	.68,5	.66,2	.67,6	.70,6	.71
	Canton tael.....	.68,3	.66	.67,4	.70,4	.70,8
	Chefoo tael.....	.65,5	.63,3	.64,6	.67,5	.67,9
	Chinkiang tael..	.66,9	.64,6	.66	.69	.69,3
	Fuchau tael.....	.63,4	.61,2	.62,5	.65,3	.65,6
	Haikwan tael...	.69,7	.67,3	.68,8	.71,8	.72,2
China.....	Hankau tael.....	.64,1	.61,9	.63,3	.66	.66,4
	Ningpo tael.....	.64,3	.63	.65	.67,9	.68,2
	Niuchwang tael.	.65,9	.62	.63,4	.66,2	.66,5
	Shanghai tael...	.62,6	.60,4	.61,7	.64,5	.64,8
	Swatow tael.....	.63,3	.61,1	.62,4	.65,2	.65,5
	Takao tael.....	.66	.66,6	.68	.71	.71,4
	Tientsin tael.....	.66,4	.64,1	.65,5	.68,4	.68,8
Colombia.....	Silver peso.....	.42,4	.40,9	.41,8	.43,6	.43,9
Ecuador.....	....do .....	.42,4	.40,9	.41,8	.43,6	.43,9
India.....	Silver rupee .....	.20,1	.19,1	.19,9	.20,7	.20,8
Mexico.....	Silver dollar.....	.46	.44,4	.45,4	.47,4	.47,7
Persia.....	Silver kran .....	.07,8	.07,5	.07,7	.08	.08,1
Peru.....	Silver sol.....	.42,4	.40,9	.41,8	.43,6	.43,9

COLLEGE SETTLEMENTS. The college settlement movement owed its origin to the teaching of men like Kingsley, Ruskin, and Greene, and to the practical work of Edward Denison and Arnold Toynbee in the sixties and seventies. It soon spread to America, where the college settlement in New York City, and Hull House in Chicago were opened in 1889. It was reported in 1898 that there were some fifty settlements in Great Britain, and over eighty in the United States. The aims of the settlement are to become the centre of a social life in its neighborhood with a view to its improvement and to aid in the solution of social and industrial problems in cities. There has been formed in the United States a College Settlements Association having for its aim the foundation and maintenance of settlements. A small subscription fee entitles persons to membership. In 1898 the association had chapters at Wellesley, Smith, Vassar, Bryn Mawr, Radcliffe, Wells, the Packer Collegiate Institution, Cornell, Elmira, the Women's College of Baltimore, and Barnard College. It has supported the College Settlement in New York, the St. Mary's Street Settlement in Philadelphia, and the Denison House in Boston. It is the outcome of the efforts for social improvement on the part of college-bred women. Its central organization consists of an electoral board, the president of which in 1898-99 was Miss Vida Scudder, and the secretary, Miss Susan G. Walker, Fiske Hall, Barnard College, New York City. The immediate administration of the settlements is in the hands of local executive committees, each settlement being presided over by a head-worker. The New York College Settlement is in Rivington street where there is a large foreign population consisting largely of Russian and Polish Jews, and the neighborhood is crowded and ill-built. The work of this settlement includes, 1st, efforts to supply a wholesome kind of social entertainment through the organization of various clubs which are connected with the house and at which are given lectures musical recitals, and other entertainments; 2nd, educational work, including a kindergarten, a small vacation school, a library and course of lectures; 3d, industrial work, including instruction in cooking, sewing, and elementary carpentering; 4th, artistic work including music, drawing, and clay modelling; 5th. economic work, including instruction in political economy. Besides this, the settlement maintains a summer home which, during the season beginning June 9th, and closing September 10, 1898, was visited by 232 persons.

The Philadelphia settlement was first established in St. Mary's street, the name of which was subsequently changed to Rodman street. A cottage near West Chester was placed at the disposal of the settlement. Situated in an ill-built, overcrowded quarter, with bad sanitary condition, the settlement attempted to introduce improvements. It favored the establishment of small parks, and in 1895 a number of buildings were torn down, resulting in improving the condition of the neighborhood. The number of workers has greatly increased and lectures, classes, clubs, etc. are maintained. The settlement has become a gathering place for the children and young people of the neighborhood.

Denison House, 91 and 93 Tyler street, Boston, is situated in a district wholly different in character from those in which the New York and Philadelphia settlements

are located. The neighborhood does not contain any large number of the very poor, but comprises for the most part wage-earners living under normal conditions. It is therefore said to offer a good opportunity for the study of the conditions of the average industrial workers. The settlement has organized clubs, cooking classes, kitchen garden work, and has been successful both in the work of education and in that of providing proper social pleasures for the people of the neighborhood. The educational work for the children is divided into the kindergarten department; a primary department, including classes in clay modelling, wood work, sewing, singing; and an advanced department, including classes in carpentering, nature study, color work, drawing, clay modelling, sewing and singing.

The following list of college, social, and university settlements in the United States is included in Mr. John Palmer Gavitt's bibliography compiled for the College Settlements Association.

California.—Casa De Castelar, corner of Castelar and Ord streets, Los Angeles, California; The South Park Settlement, 15 South Park, San Francisco, California; The Manse, 1730 Eighth street, West Oakland, California.

Connecticut.—Social Settlement of Hartford, 15 North street, Hartford, Conn.

Illinois.—Chicago Commons, 140 North Union street, Chicago; Clybourn Avenue Settlement (formerly Olivet Mission), corner Clybourn avenue and Halsted street, Chicago; Elm Street Settlement (formerly Unity Settlement), 80 Elm street, Chicago, Ill.; The Forward Movement (formerly known as Epworth House), 219 South Sangamon street, Chicago; Helen Heath Settlement (All Soul's Church, Chicago), 869 Thirty-third Court; Hull House, 335 South Halsted street, Chicago, Ill.; Kirkland School Settlement, 334 Indiana street, Chicago, Ill.; Maxwell Street Settlement, 270 Maxwell street, Chicago, Ill.; Medical Missionary College Settlement (Seventh Day Adventists' Medical, Missionary and Benevolent Association), 1926 Wabash avenue, Chicago, Ill.; Neighborhood House, 1550 Sixty-ninth street, Chicago, Ill.; Northwestern University Settlements, 252 West Chicago avenue, Chicago, Ill.; University of Chicago Settlement, 4638 Ashland avenue, Chicago, Ill.; The Delano Settlement, corner Foster and Myrtle streets, Evanston, Ill.

Indiana.—Terre Haute Settlement, 28 North First street, Terre Haute, Indiana.

Iowa.—Roadside Settlement (Des Moines Local Union of King's Daughters and Sons), 720 Mulberry street, Des Moines, Iowa; College House, 615 Pearl street, Grinnell, Iowa.

Kansas.—Bethany School, corner North First and Riverview street, Kansas City, Kansas.

Kentucky.—Neighborhood House, 324 East Jefferson street, Louisville, Kentucky.

Maryland.—Lawrence House, 214 Parkin street, Baltimore, Maryland; Locust Point Settlement, 1409 Hull street, Baltimore, Maryland.

Massachusetts.—Ben Adhem House, Mall street, Roxbury, Boston, Mass.; Denison House (Boston College Settlement), 91 and 93 Tyler street, Boston, Mass.; Elizabeth Peabody House, 156 Chambers street, Boston, Mass.; Epworth League House, 34 Hull street, Boston, Mass.; Hale House, 6 Garland street, Boston, Mass.; Lincoln House, 116-122 Shawmut avenue, Boston, Mass.; South End House (formerly Andover House), 6 Rollins street, Boston, Mass.; St. Stephen's House, 2 Decatur street, Boston, Mass.; Willard "Y" Settlement, 11 Myrtle street, Boston, Mass.; The Prospect Union, 744 Massachusetts avenue, Cambridge, Mass.

Michigan.—Berean Social Settlement "Our Neighborhood Cottage," 642 Russell street, Detroit, Mich.; Bissell House, 425 Ottawa street, Grand Rapids, Mich.

Minnesota.—Unity House, 1620 Washington avenue North, Minneapolis, Minn.; St. Paul Commons, Eighth and Jackson streets, St. Paul, Minnesota.

Missouri.—St. Louis Social Settlement, 2501 South Second street, corner Victor street; St. Stephen's House, Sixth and Rutgers streets, St. Louis, Mo.

Nebraska.—Graham Taylor House, 945 North Eighth street, Lincoln, Nebraska.

New Jersey.—Whittier House, 174 Grand street, Jersey City, N. J.; Orange Valley Social Institute, Orange Valley Post-Office, New Jersey; Dundee House, 20 Second street, Passaic, New Jersey.

New York State.—Neighborhood Settlement, the Astral, 184 Franklin street, Greenpoint, Brooklyn, N. Y.; Welcome Hall, 437 Seneca street, Buffalo, N. Y.; Westminster House, 424 Adams street, Buffalo, N. Y.; All Soul's Friendly Aid House, 248 East Thirty-fourth street, New York, N. Y.; Amity Church Settlement, 312 West Fifty-fourth street, New York, N. Y.; Association House, 259 West Sixty-ninth street, New York, N. Y.; Calvary House Settlement, 355 East Twenty-second street, New York, N. Y.; Church Settlement House, 329 East Eighty-fourth street, New York, N. Y.; College Settlement, 95 Rivington street, New York, N. Y.; Community House (The Pro-Cathedral Church), 153 Essex street, New York, N. Y.; East Side House, Seventy-sixth street and East River, New York, N. Y.; Grace Church Settlement, 417 East Thirteenth street, New York, N. Y.; Hartley House, 413 West Forty-sixth street, New York, N. Y.; Normal College Alumnae House, 446

East Seventy-second street, New York, N. Y.; The Nurses' Settlements, 265 Henry street, 279 East Broadway, and 312 East Seventy-eighth street, New York, N. Y.; The Phelps Settlement, 314-316 East Thirty-fifth street, New York, N. Y.; Union Seminary Settlement, 237 East One-Hundred and Fourth street, New York, N. Y.; The University Settlement, 26 Delancy street, New York, N. Y.; Young Women's Settlement, 163 Avenue B, New York, N. Y.

North Carolina.—Log Cabin Settlement, Grace Post-Office, Buncombe county, N. C.

Ohio.—Cincinnati Social Settlement, 300 Broadway, Cincinnati, Ohio; Goodrich Social Settlement, 368 St. Claire street, Cleveland, Ohio; Hiram House, 183 Orange street, Cleveland, Ohio.

Pennsylvania.—College Settlement of Philadelphia, 617 Carver (formerly St. Mary) street, Philadelphia, Pa.; Eighth Ward House, Locust street, above Ninth, Philadelphia, Pa.; Neighborhood Guild (hitherto known as Minster street Neighborhood Guild), 618 Addison street, Philadelphia, Pa.; Princeton House, 505 Pine street, Philadelphia, Pa.; St. Peter's House, 100 Pine street, Philadelphia, Pa.; Kingsley House, 1709 Penn. avenue, Pittsburg, Pa.

Wisconsin.—Happy Home Settlement, 336 Jefferson street, Milwaukee, Wisconsin.

COLOMBIA, REPUBLIC OF, the most northwestern country of South America, comprising nine departments under Governors. Before the promulgation of the constitution, Aug. 4, 1886, these departments had been distinct States, each under a President. The estimated area is 513,938 square miles and the estimated population (1895) about 4,000,000, including 150,000 uncivilized Indians. The census taken in 1870 gave the population as 2,951,323, and the official estimate in 1881 was 3,787,600. The capital is Bogotá and the departments are known as follows: Antioquia, Bolivar, Boyacá, Cauca, Cundinamarca, Magdalena, Panama, Santander, and Tolima; of these Cauca is the largest with an estimated area of 257,462 square miles, and Santander the smallest with 16,409 square miles. The most populous are Boyacá, Cauca, and Cundinamarca, and the least populous, Magdalena. The most important cities are Bogotá (population about 120,000), Barranquilla (40,000), Medellin (40,000), Bucaramanga (20,000), Cartagena (20,000), Cúcuta (10,000).

Government.—The chief executive is a President chosen by an electoral college for six years; he has ministers of Foreign Affairs, Finance, War, Public Instruction, the Interior, and the Treasury, all officially responsible to Congress. The legislative power is vested in a Congress consisting of a Senate and a House of Representatives, there being 27 Senators and 66 Representatives; the latter are chosen for four years by universal suffrage, the ratio being one member for about 50,000 inhabitants. The governors of the departments are appointed by the President and are removable at his pleasure; but the departments have retained some of the prerogatives of their former sovereignty, such as control of finance. Dr. Rafael Nunez, who was elected President for the fourth time in 1892, died September 18, 1894, and was succeeded by the Vice-President, Senor Don Miguel Antonio Caro, who is the present incumbent.

Revenues and Expenditures.—Official estimates in pesos (\$0.436) of revenue and expenditure for fiscal years ending June 30:

	1891-2	1893-4	1895-6
Revenue	26,023,160	27,312,381	26,226,300
Expenditure	26,979,325	33,502,386	35,773,882
		1897-8	1898-9
Revenue		34,361,000	38,305,000
Expenditure		35,771,013	

It was estimated that the expenditure for the year ending June 30, 1899, including the deficit for the previous year and the decreased value of paper currency, would not exceed 34,000,000. The revenue is derived largely from customs duties, which were estimated for 1897-98 at 19,500,000 pesos. On June 30, 1896, the internal debt, exclusive of paper currency amounting to 30,862,352 pesos, aggregated 7,525,156 pesos. The external debt, due largely to British creditors, in 1896, was, including arrears, £3,514,442.

Industries.—The principal industries are mining and agriculture. The latter, however, is not in an advanced state, and only a small part of the country is under cultivation. Much of the land is fertile, but at present useless, for lack of means of transportation. Manufacturing industries are almost unknown. Most tropical products may be cultivated successfully; coffee is the most important and its cultivation is extending rapidly; in many parts of the country cacao, sugar-cane, and all kinds of fruits grow in abundance; there are also produced tobacco, vegetable ivory, rubber, wheat, maize, plantains, indigo, vanilla, cabinet and dyewoods, and medicinal

plants. In Tolima are large grazing districts. The total number of cattle, horses, mules, and asses in Colombia is estimated at 3,465,000; of swine, sheep, and goats 3,487,000.

Mineral Resources.—Of the mineral resources gold is the most important, but there are also many silver mines. Other minerals are worked to a greater or less extent, including iron, asphalt, petroleum, salt, copper, lead, mercury, platinum, manganese (7 mines), cinnabar (14 mines), emeralds (32 mines). The gold-bearing districts of Colombia extend through the west central section of the country from Ecuador to the upper districts of the State of Bolivar, but the metal is found to some extent in all of the nine departments and silver in many of them. On both sides of the above mentioned district the rock is non-auriferous, but placer deposits are found. Gold mining in Colombia seems to be giving fair and regular returns; there are thousands of mines, many of them worked in small and primitive fashion, but some have come into the possession of syndicates which carry on the work with more modern methods. The State of Tolima is rich both in gold and silver. The gold is found in placer deposits and the silver ore, much of which is of low grade, is "concentrated" at the mines and shipped to England for the final smelting. The syndicates are largely English, although there are companies which represent the French, Germans, and Americans. In the State of Antioquia are a great many mines most of them small, in which both quartz and placer deposits are worked in rude and native fashion. These mines, however, are probably the richest of any in Colombia, and the shipments of gold from Medellin, the capital, average about \$300,000 a month. Recently the gold mines in the region of Darien have been reopened. They lie between Real and Cana, were formerly worked by the Spaniards, and at present are very difficult of access. Previous to 1888 the mines had not been worked for more than a century and a half; at this time they were reopened by an English company but the enterprise was attended with little success until 1893 when some of the old Spanish workings were struck ninety feet below the surface. This rock, although culled over by the Spaniards, yields from 1 to 1½ oz. a ton, and a much larger yield is expected from the virgin lode. It is said that the Espiritu Santo mine at Cana produced for the Spaniards between 1680 and 1727 more than \$30,000,000.

Commerce.—Value in pesos of foreign commerce:

	1893.	1894.	1895.
Imports	13,403,299	10,711,207	11,528,365
Exports	14,630,332	15,962,019	15,088,406

The chief imports are textiles, food-stuffs, beverages, and iron and steel; the exports follow very closely the principal products mentioned above, excepting cereals. The coffee export in 1895 amounted to 21,500 tons. Of the total imports about 60 per cent. enter by Barranquilla and 20 per cent. by Cartagena. The transit trade across the isthmus is very important. In 1896 there were carried from Colon to Panama: from Europe 92,137 tons, from New York 51,417; for Europe 56,071, for New York 33,701; local traffic in both directions, 28,219.

Railways.—The following is a list of the more important railways, giving their ownership and length:

Northern Railway (Bogotá and Zipaquira) National.....	31 miles
Girardot (Bogotá and Juntas de Apulo) National.....	24 miles
Cucuta (Madrid and Puerto Villa Migar) Colombian.....	34 miles
Sabana (Bogotá and Facatativá) Colombian.....	24 miles
Antioquia (Puerto Barrio and Monos) Department of Antioquia.....	32 miles
Cartagena to Calamar, American (U. S.).....	65 miles
Panama to Colon, American (U. S.).....	47 miles
Cauca (Buenaventura and San Jose), American, (U. S.).....	21 miles
Puerto Colombia (Santa Marta and Sabanilla) English	46 miles
Baranquilla to Sabanilla English.....	16 miles
Yeguas to Honda English.....	15 miles
Total	346 miles

The following extensions to these roads have been proposed, most and perhaps all of which will be constructed: the Puerto Colombia to Heredia on the Magdalena River; the Cauca to Cali, 64 miles; the Antioquia to Medellin, 91 miles; the Yeguas-Honda to La Maria, 7 miles; the Girardot to Madrid, 48 miles; the Cucuta to the Venezuela border.

Army.—At each session of Congress the strength of the national army may be determined but in the case of war the President may call for what he deems is a sufficient number. In 1896 the peace footing was placed at 10,000.

Education.—Primary education is free, but not compulsory. In 1894 there were 1,817 primary schools, with about 89,000 pupils and 15 normal schools with about 600 students. There is a national university with about 1,600 students, and four colleges belonging to departments with 1,083 students; there are also 34 public institutions for secondary education. A library, museum, and observatory are owned by the government. The religion of the country is Roman Catholic, but other faiths are tolerated.

History.—The event that attracted most attention in the history of Colombia during the year 1898 was the re-opening of the difficulty with Italy in the matter of the Cerruti case. In 1885 Ernesto Cerruti, an Italian subject doing business in Colombia was thrown into prison by the political party in power on the ground that he had sympathized with its opponents; his business was broken up and his personal property seized. After negotiations it was decided by both governments to submit the case to the Spanish court for arbitration, but the decision was unsatisfactory and President Cleveland was agreed upon as the final arbitrator. The latter decided that Colombia should allow damages to Cerruti to the extent of about \$300,000 for the loss of his personal property, and further stated that the Colombian government should guarantee him against claims of his partners. The personal damages appear to have been promptly paid to Cerruti, but the partners in his business preferred claims which were supported by the Italian government, but resisted by the Colombian. Matters reached a crisis in July, when Colombia broke off diplomatic relations, and the Italian government despatched a fleet to Colombian waters. The representatives of the United States and Great Britain again intervened with the effect of bringing about an adjustment which was accepted by Italy and the latter abandoned the coercive measures which she had proposed. It was announced that the matter was settled to the satisfaction of the Italian government on August 14, but there was a hitch in the proceedings and an apparent intention on the part of Colombia to break off diplomatic relations in the middle of September. Again the intervention of friendly powers prevented a rupture, and the matter was apparently compromised.

COLONIAL DAMES OF AMERICA, organized in New York May 23, 1890, was the first society of patriotic women founded in the United States. Its aims are patriotic and educational, and its especial care is collecting relics and preserving traditions of the thirteen original States. It also furthers the celebration of national holidays and events and cultivates a spirit of reverence for American history and of patriotism among the young. President, Mrs. John Lyon Gardiner; Vice-Presidents, Mrs. Thomas W. Ward and Mrs. James W. Gerard; Treasurer, Mrs. Oscar E. Schmidt; Secretary, Mrs. Timothy M. Cheesman; and Historian, Miss Julia L. Delafield. Headquarters, 156 Fifth ave.

COLONIAL DAMES OF AMERICA, NATIONAL SOCIETY OF, distinct from the foregoing, has branches in the thirteen original States, in the District of Columbia, and in twenty-two other States. The membership now of 3,500, consists of those "who are descended in their own right from some ancestor of worthy life who came to reside in an American colony prior to 1750, which ancestor, or some one of his descendants, being a lineal ascendant of the applicant, shall have rendered sufficient service to his country during the colonial period, either in the founding of a commonwealth or of an institution which has survived and developed into importance, or who shall have held an important position in the colonial government, and who, by distinguished services, shall have contributed to the founding of this great and powerful nation." President, Mrs. Justine Van Rensselaer Townsend; Vice-Presidents, Mrs. Gillespie, Philadelphia, and Mrs. W. W. Gordon, Savannah, Ga.; Secretary, Mrs. William Reed, Baltimore, Md.; Treasurer, Miss Elizabeth Byrd Nicholas, Washington; and Registrar, Mrs. Emil Richter, Portsmouth, N. H.

COLORADO, a western State of the United States with a land area of 103,645 sq. m. Capital, Denver.

Agriculture.—Colorado is undergoing an agricultural development that would be remarkable in any State and is especially noteworthy in one popularly supposed to be a purely metallic region. Official reports for the calendar year 1898 showed the following productions and values of leading staples; corn, 3,113,892, \$1,245,557; wheat, 6,729,565, \$3,768,556; oats, 3,063,191, \$1,255,908; barley, 353,952, \$162,818; potatoes, 2,564,331, \$1,384,739; rye, 47,484, \$23,742; and hay, 1,760,728 tons, \$9,507,931—total value \$17,349,251. The dairy products had a value of about \$15,000,000, and the orchards about \$5,225,000. In live-stock the appreciation in 1898 was still more pronounced, viz.: horses 148,687; mules 8,667; milch cows 91,666; oxen and other cattle 973,259; sheep 1,655,551; and swine 20,713—total head, 2,898,543. The sales of livestock realized \$6,200,000, and the wool clip \$265,000.

Industries.—Reports of 1898 showed that Colorado had maintained her newly-gained rank of first gold-producing State in the Union. Authorities differed as to the actual output, but all agreed on an amount exceeding that of California. The mint authorities at Denver estimated the production of 1897 at \$22,000,000; another esti-

mate placed it at \$22,500,000; and the most conservative of all fixed it at \$19,579,637. There was a general agreement that the Cripple Creek district had yielded steadily over \$1,000,000 per month, or \$12,500,000 in the year. Gilpin, San Miguel, Clear Creek, and Lake counties followed in productiveness in the order given. The latter, which contains Leadville, yielded \$1,000,000, and the four counties together, about \$8,500,000. With the increase in the production of gold there has been a steady decrease in that of silver, the yield in 1897 being valued at \$13,062,400. Other mineral products were lead, \$2,287,000; copper \$1,167,200; iron \$3,368,000; and coal \$5,275,000. The agricultural, mining, and live-stock interests yielded approximately \$92,350,000 in the year. In 1898 there was a revival in the mining industry. In 1898 the output of gold was estimated at \$24,500,000. The number of men employed in mining was 30,231. The coal production was 3,565,660 tons. Cattle-raising, agriculture, fruit-raising, and general building operations were all in an exceptionally flourishing condition. No less than 4,174,037 tons of coal were produced in Colorado in 1898. The production of lead, copper, silver, iron and manganese, building stones, marble and onyx surpasses that of the previous year. Petroleum is about the same. (See also articles ASPHALTUM, FULLER'S EARTH and MINING.) The new commercial products of the year are uranium, gilsonite and sulphur. Wire tramways and railroad switch extensions have improved means of transportation. The mountain streams are being used to aid the generation of electricity and the power is transmitted to various points for consumption.

Banking.—On October 31, 1898, there were 37 national banks in operation and 28 in liquidation. The active capital aggregated \$4,807,000; circulation \$1,739,268; deposits \$35,446,575; and reserve \$14,672,775. The State banks on June 30, 1898, numbered 38, and had capital, \$1,641,964; deposits, \$5,285,333; and resources \$7,631,906. The exchanges at the United States clearing-house in Denver during the year ending September 30, 1898, aggregated \$140,809,492, an increase of \$18,958,860 in a year.

Education.—At the end of the school-year 1896-7 there were 100,880 children enrolled in the public schools, of whom 69,606 were in daily attendance. The value of all public school property was \$4,093,304, and the expenditures of the year, including over \$1,320,000 paid to 3,120 teachers, for salaries, aggregated more than \$2,385,000. There were 41 public high schools, with 196 teachers and 4,635 pupils, 7 private secondary schools, with 33 teachers and 297 pupils; and a public and private normal school, with 30 teachers and 518 students. For higher education there were 4 colleges and universities, co-educational and for men only, with 106 professors and instructors and 1,023 students; 2 schools of technology, with 36 instructors and 403 students; and 2 theological, 2 law, and 4 medical schools. The Colorado Agricultural College at Fort Collins, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 310 periodicals, of which 39 were dailies, 237 weeklies, and 28 monthlies. The legislature in 1897 appropriated \$240,423 for the State educational institutions, and authorized the erection of an industrial school for girls in or near Denver.

Finances.—The total assessed valuation on November 30, 1897, was \$198,000,000, the lowest amount since 1885, and the State tax was \$4.10 per \$1,000. The gross debt, December 1, 1897, was \$3,476,573, the larger part comprising outstanding warrants, and the treasury held assets of \$778,933, leaving the net debt \$2,697,640. Besides the above State tax rate there is a poll tax of \$1 per capita, formerly 50 cents. The net debt was increased \$404,328 in a year.

Population.—As estimated by Federal officials the population on June 30, 1898, was about 525,000. The following estimates of cities and towns were given: Pueblo, 36,000; Colorado Springs, 23,000; Cripple Creek, 7,000; Victor, 5,000; Cañon City, 5,000; Grand Junction, 4,370; and Creede, 2,500.

The State Elections of 1898.—The elections were interesting from the fact that there were fifteen tickets in the field and the Fusionists carried everything before them. Arapahoe county, including Denver, cast 10,000 Fusion majority, and El Paso county, including Colorado Springs, 4,000. The Republicans won only in the eastern part of the State. The Fusionists have also an overwhelming majority in the legislature. Charles S. Thomas (Dem.) was elected Governor, receiving 92,274 votes and a plurality of 43,394, the largest ever given to any Governor of Colorado. The delegates to the House of Representatives are: John F. Shafroth (Sil.), from Denver, and John C. Bell (Pop.), from Montrose; Senators: Edward O. Wolcott (Rep.), from Denver, and Henry M. Teller (I.), from Central City. Officials: Charles S. Thomas (Dem.), Governor; Francis Carney (Pop.), Lieutenant-Governor; E. F. Beckwith (Pop.), Secretary of State; John F. Fisher (Rep.), Treasurer; Geo. W. Temple (Rep.), Auditor; C. L. Moses (Rep.), Adjutant-General; D. M. Campbell (Rep.), Attorney-General; and Helen Grenfell (Rep.), Superintendent of Education. Chief Justice John Campbell (Rep.); Associates, Luther M. Godderd (Dem.), and William H. Gabbert (Dem.); and Clerk, H. G. Clark (Rep.). In the State legislature there are 30 Democrats, 8 Republicans, 29 Populists, and 33 Silverites.

COLORED MASONIC BODIES consist of 31 grand lodges in the U. S. and one in Canada. The earliest was the African Lodge, No. 459, for which a warrant was given on Sept. 24, 1784, to Prince Hall and 15 other colored masons. Its hundredth anniversary was celebrated in Boston on Sept. 24, 1884, by a large gathering of colored masons. The oldest lodge now existing is the Prince Hall Grand Lodge, an outgrowth of the former, organized in 1808, which erected a monument in Boston to Prince Hall in 1895. The largest lodge is that of Missouri, having 5,000 members. The colored masons in the U. S. and Canada number 35,123; Royal Arch, 13,000; Knights Templar, 10,325; Nobles of the Mystic Shrine, 1,326; and A. A. S. Rite, 5,712. See ODD FELLOWS.

COLORED METHODISTS, are composed of the African Methodist Episcopal, Union American Methodist Episcopal Zion, and Colored Methodist Episcopal Church. The A. M. E. is the strongest and carries on the largest missionary work in Haiti, Africa, and Liberia. It consists of 5,850 churches, 5,725 ministers, and 750,354 members. In 1898, the A. M. E. Zion, ordained the wife of Bishop J. B. Small to elder's orders, which created much discussion. 86 new churches were erected, and the Christian Endeavor work was important. The missions in Africa were much extended and agencies were arranged for Cuba, Porto Rico, and Hawaii. The reports for 1898 give 1,749 churches, 2,786 ministers, and 519,681 members. The district occupied by the Union American M. E. Church lies between New York, and Washington, and Pittsburg. It has not progressed as rapidly as the others, having but 61 churches, 63 ministers, and 2,675 members. The Colored M. E. church is an off-shoot from the white M. E. Church, South, 1874. It has extensive local missionary work, and publishes many periodicals. During the year many churches were erected and the congregations increased greatly. The report gives 1,300 churches, 2,187 ministers, and 199,206 members.

COLTON, GARDNER QUINCY, M. D., New York dentist, died in Rotterdam, Holland, August 11, 1898. He was born at Georgia, Vermont, February 7, 1814; became a chairmaker; entered the College of Physicians and Surgeons, New York, in 1842. He was associated with Horace Wells, a dentist of Hartford, Connecticut, who discovered in 1844 that the inhalation of nitrous oxide gas obtunded sensibility, and who used it as an anæsthetic about the same time in 1846 that Dr. Wm. T. G. Morton of Boston, Wells' former partner extracted teeth from patients under its influence. The honor of the original discovery has been claimed on behalf of each of these three men. It was stated that from the time of this discovery Dr. Colton and his assistants pulled 1,000,000 teeth; but the gas was not used to any great extent until 1863.

COLUMBIA, BRITISH, a province of the Dominion of Canada, with an estimated area of 383,300 sq. m.

Mineralogy.—The production of the precious metals in the calendar year 1897 was gold, \$2,724,657; silver, \$3,272,836; copper exports, 6,093,461 pounds. Coal yielded 988,796 short tons, of which 671,313 tons were exported. At the close of 1898 it was estimated that the year's output of the precious metals would exceed \$12,000,000 in value, the greater part being mined in the Trail and Kootenai districts, and that the increased output of the province and the Klondike region would give Canada fifth place among gold-producing countries, with a total yield valued at \$14,190,000. There were about 3,000 companies operating in the province.

Fisheries.—The value of all fishery catch in the calendar year 1896 was \$4,183,999; value of all apparatus used, \$2,614,578; principal catch, salmon, \$3,142,732, and halibut, \$113,828; exports of fishery products (1897) \$3,400,645.

Commerce.—In the fiscal year ending June 30, 1897, the imports of merchandise aggregated in value \$7,001,861, of which \$6,926,504 was entered for home consumption; exports, \$14,017,568; duty collected, \$1,558,889. Registered vessels in direct foreign trade had an aggregate tonnage of 28,604, and all vessels, British and foreign, engaged in the coasting trade, 3,551,340. Navigation along the coast was facilitated by 16 lighthouses.

Banks.—On June 30, 1897, there were 26 post-office savings banks, with 2,392 depositors and \$578,600 deposits, and one government savings bank with 3,229 depositors and \$955,804 deposits.

Railways and Telegraph.—In 1897 the total length of railways was 860 miles and of telegraph lines, all land, 567 miles. At the session of the provincial legislature in 1898 a "public works loan act" was passed, providing for a loan of \$5,000,000 for railroad purposes. Charters were granted for 21 new railways, and a total of 1,040 miles of new railway was subsidized, which will call for \$4,160,000. New lines projected include one of 400 miles from the west coast of the province to Teslin Lake, and one of 80 miles from Boundary Creek to Robson, each to receive \$4,000 per mile. The act prohibits the employment of Chinese or Japanese either in the work of construction or operation of any subsidized undertaking.

Education.—In 1897 there were 213 common schools, with 223 teachers, 6,332 en-

rolled pupils, and 3,808 in daily attendance; 27 graded schools, with 149 teachers, 9,005 enrollment, and 5,912 attendance; and 4 high schools, with 12 teachers, 461 enrollment, and 280 attendance. The expenditures were \$236,681, of which \$200,637 was for teachers' salaries. There were ten public libraries with a total of 11,303 volumes. Periodicals of all kinds in 1898 numbered 39.

Finances.—The revenue of the province in the year ending Sept. 30, 1897, was \$1,383,048; expenditure, \$1,569,071; gross debt, \$6,586,004; assets, \$2,301,989; net debt, \$4,284,015.

Population.—The Indian population in 1897 was 24,946, a decrease of over 10,000 in five years. There were 35 schools for Indian youth, which had an enrollment of 1,352, and attendance, 789. The Indians cultivated 11,207 acres of land, had 22,736 head of live-stock, and received \$588,344 for their fish, fur, and other industries. Local estimates in 1898 gave Vancouver 22,000 population; Rossland, 5,000; Nelson, 3,000; Union, 2,500. See CANADA.

COLUMBIA UNIVERSITY, non-sectarian, at Morningside Heights, New York City, founded 1754; in 1898 had 325 instructors, 2,157 students and over 250,000 volumes in the library. The value of the new site is estimated in the last report of President Low as \$6,879,011. The gifts for the year amounted to \$354,416 in money, and real estate in the City of New York valued at \$1,100,000 was given by Duc de Loubat for the purpose of endowing the library. Volumes to the number of 16,377 were added to the library; 495 degrees were conferred and 20 courses of lectures given at the University, the Metropolitan Museum of Art, the Museum of Natural History, and Cooper Union. In 1898 the new gymnasium was opened under the directorship of Dr. Watson L. Savage. It is on a large scale, having one of the largest swimming tanks in the country and an excellent running track. A most important step in the direction of broader relations with the educational work of the country at large has been the closer union in 1898 between Columbia and the Teachers' College, a step made possible by the removal of Columbia to Morningside Heights in 1897. The finances are kept separate as before, but the Teachers' College has become a part of the university system. The number of officers of instruction in the Teachers' College in 1898 was 61, of students including the extension classes and the Horace Mann school, 1,491. President, Seth Low, LL. D. See PSYCHOLOGY, EXPERIMENTAL, and UNIVERSITIES AND COLLEGES.

COMEDIE FRANCAISE. The important new works represented in 1898 were: *La Martyre*, by Jean Richepin, the theme of which was the conflict of Christianity and Paganism; *Le Berceau*, a play in three acts, on divorce, by Brieux; and *La Confiance*, by Louis Lavigner, performed on the 259th anniversary of Racine. On the 7th of March Mlle Suzanne Reichenberg, "*La même doyenne*," retired.

COMETS. See ASTRONOMICAL PROGRESS.

COMMERCE. See the articles on the countries.

COMMERCIAL TRAVELERS' HOME ASSOCIATION OF AMERICA, founded in Binghamton, New York, in 1892, by commercial travelers "To provide and maintain a home and hospital for the care, maintenance and relief of worthy indigent commercial travelers, their dependent wives, widows and infant children, and to build, furnish and maintain in connection therewith a school for the benefit of said infants, and to provide and furnish such other aid and assistance to the members thereof and their families as may be provided by the by-laws." The real estate, on which the home is now being erected, is valued at \$50,000. Forty branches of the Home Association have been organized in various cities. The *Home Magazine*, started as a private enterprise, was purchased by the association in 1894, and is published regularly. President, George E. Green, Binghamton, New York; Secretary and Treasurer, L. M. Georgia.

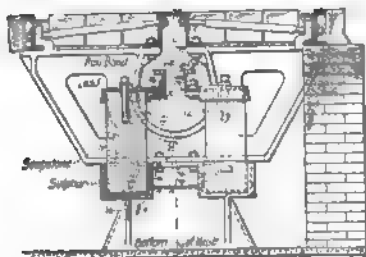
COMPARATIVE LITERATURE SOCIETY, organized in 1897, membership 300. Council: T. W. Higginson, H. H. Furness, W. D. Howells, R. H. Stoddard, and Charles Dudley Warner; Charles Sprague-Smith, Managing Director. The lectures are given in Carnegie Hall, New York. Study topic for 1899, Folklore.

CONDENSER, ABSORPTION IN. See PHYSICS (paragraph Electrical Measurements by Alternating Currents).

CONDUIT ELECTRIC RAILWAYS, are those which have some form of conduit or trough below the level of the rails, either between or at the side of the track. Usually there is a slot or continuous opening to the street through which the "plow" projects from the bottom or side of the car. Inside the conduit, supported upon suitable insulators, pins or brackets, are generally the conductors against which suitable rollers or rubbing blocks, forming part of the plow are pressed. In this way current can be taken from one conductor, up through the slot on a wire embedded in the plow, through the motor and again back to the other conductor. There are other types employing a closed conduit, and in one of these the slot is closed by a flexible sheet which is depressed by a roller projecting from the car until the flexible cover

touches the conductor inside the conduit. Still other types employ closed conduits and operate magnetic switches with current from storage batteries on the car; the current being conveyed to the switches through buttons or contact plates embedded in the paving between the tracks, and suitable contacts on the car, or in some cases powerful magnets on the car operate switches in the conduit.

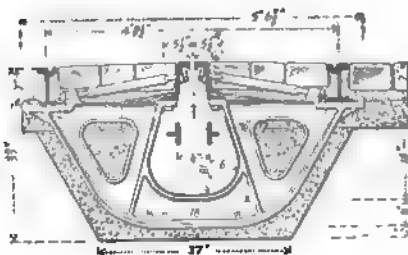
It is beyond the scope of this book to describe the many automatic, magnetic, and other conduit systems, none of which are in operation to-day on a commercial scale with the exception of the first mentioned, which is now regarded as the only practical form. The automatic conduit system was first installed in Budapest, Austria, in July 30, 1889, the conduit being at one side so that the slot rails formed one track. The slot rails are bolted to cast iron yokes placed 33½ ft. apart. The conduit proper is formed of concrete and is about 11 inches wide and 13 inches high. The next attempt was in Chicago, Ill., in March, 1892, where 1½ miles of conduit road was installed using the Love system. This is much the same as the others, only the conductors are nothing more than the ordinary trolley wires suspended inside the conduit from small, light insulators; this system failed owing to leakage and break downs and was finally abandoned.



Section of Conduit used on the Lenox Avenue, New York Line of the Metropolitan Street Railway.

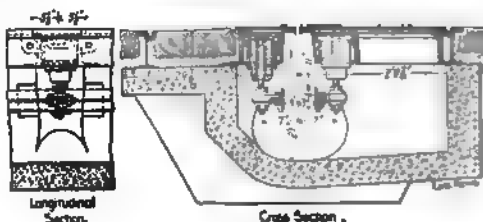
now operates some 200 miles of surface railway from temporary stations; eventually power for the entire system will be supplied from a 45,000 H. P. Standard located at about the centre of the city. (See ELECTRIC LIGHT AND POWER STATIONS.) The Third Avenue Ry. Co., of New York is also changed over to conduit and will erect a 65,000 H. P. power station at one end of its lines. St. Louis is changing over its cable lines and the indications are that Chicago and other large cities both here and abroad will do the same in the near future.

This system while more expensive is less dangerous and far more satisfactory in all ways, than the old style of overhead trolley. It is very expensive to construct, ranging as high as \$50,000 per mile of single track, the average being about \$30,000 per mile. This large cost is due to the very considerable amount of work required to shift the pipes, sewers and other underground structures along the line of track where they conflict with the conduits.



Section of the Conduit used in Washington, D. C., Showing shape of Yoke and position of Conductor Rails.

In the spring of 1895 the Metropolitan Street Railway Co., of New York City, installed a conduit system on its Lenox avenue line in which cast iron yokes were placed every 5 ft., to which the rails and slot rails were bolted. The conduit was formed of concrete in the centre of the track and is about 14x14 inches and circular in shape. During the summer and fall of 1895 the Metropolitan Railway Co., of Washington, D. C., equipped a portion of its lines with the same system, later changing its entire lines to the conduit system. Within the past year the Capital Traction Co., of the same city changed its entire system, some 13 miles, from cable to conduit electric. The Metropolitan Street Ry. of New York City has also converted its lines from horse to this system and



Section of the Washington, D. C., Conduit, showing Insulators and Manhole.

As installed at present a trench about 2 ft. deep at the centre and 6 ft. wide is dug along the line of the road and heavy cast iron yokes, weighing from 400 to 500 lbs., are placed every 4 ft. To these yokes are bolted the tracks, and the rails forming the edge of the slot; forms are placed along the centre of the trench from yoke to yoke and concrete is packed around them to form the conduit; when set the forms are removed by sliding out of an opening left for that purpose. Between and at the sides of the track, at intervals of 15 ft., small covered openings are made into the

conduit and at these points heavy cast iron and porcelain insulators are bolted to the slot rails. These have pins projecting down into the conduit to which steel "T" rails weighing about 23 lbs. per yard, in lengths of 3 feet, are bolted securely. This brings the conductor rails about 6 inches apart and just 13 inches below the street surface. The car plows extend through the slot down into the egg-shaped conduit and have rubbing blocks which press against the parallel flat faces of the conductor rails. Current is supplied to these steel conductors by feeders or cables which run in underground conduits alongside the track from the power station, and are attached at intervals to the conductor rails. Drainage is secured by frequent outlets to sewers, while manholes distributed along admit of examination or repairs.

CONGER, OMAR D., ex-United States Senator from Michigan, was born at Cooperstown, New York, in 1818; died at Ocean City, Maryland, July 11, 1898. He was three times sent to the Michigan Senate by the Republicans, was then (1869) elected to Congress, and was returned from 1870 to 1880 inclusive. He was United States Senator 1881-87.

CONGO FREE STATE as defined and recognized by the European States assembled at the Council of Berlin in 1885, has an area of about 900,000 square miles with a population estimated in 1896 at 30,000,000 and consisting chiefly of Bantus. In 1897 the European population numbered 1,474 of whom the majority were Belgians. Its boundaries have been defined by various agreements since the year 1884, that separating its territories from the possessions of France being determined in 1894. By this latter agreement France acquired the "right of police" along the left bank of the Congo and over the course of the Mbomu. In 1895 the Belgian government recognized "the French right of preëmption over the Belgian possessions on the Congo in case of their alienation by sale or exchange in whole or in part." The climate is tropical and the soil fertile, producing palm oil, rubber, various gums, ground nuts, camwood, beeswax, orchilla, coffee, tobacco, rice, maize, ivory, etc. Among metals, gold and copper have been discovered. The chief exports are palm oil, rubber, rice, orchilla, gum, copal, ground nuts, and camwood. The trade has been for the most part with Belgium and the Netherlands, although England has come in for a share of the commerce. Under the Belgian rule the colony has on the whole prospered. There has been since 1888 considerable activity in railway construction, especially in 1896 and 1897. The Congo railway, for which the Belgian Chamber of Deputies provided a loan in 1896, has greatly shortened the caravan route from Matadi to Stanley Pool. It was expected that the line would be completed in 1899. The central government is at Brussels and consists of the King of the Belgians and the departments of Foreign Affairs, Finance, and the Interior. The local government is administered by a governor-general and the heads of separate executive departments together with a commander of the forces. The army is composed of native troops with European officers. There is a small navy on the Upper and Lower Congo. The main items of revenue were customs, postage, transport and an annual subsidy of 1,000,000 francs granted by the King for the ten years ending in 1900. The chief items of expenditure for 1898 were administration, public force, marine, and public works. The state has a coinage and postal service and belongs to the postal union.

Commerce, Internal Trade, and Finance.—The statistics of the commerce of Congo for the year 1897 were published in the United States Consular Reports of July 1898. According to these the general foreign trade amounted to nearly \$7,913,000 of which \$4,535,500 were imports. This total exceeds that of 1896 by over 31 per cent. Almost all of the trade is what is known as special commerce, that is the exports of articles produced in Congo and the imports of foreign commodities which are to be consumed there. The development of trade has been steadily increasing ever since 1886. The increase in the export trade is largely due to the increase in the amount of rubber exported. The greater share of the foreign commerce is taken by Belgium. The imports consist chiefly of manufactures of all kinds. The revenues have also been increasing. There are duties on imports varying as follows: A 10 per cent. ad valorem duty on arms, ammunition, gunpowder and salt; a duty of 15 francs per hectoliter on distilled spirits; a 6 per cent. ad valorem duty on all other goods of every description except the free list which covers locomotives, cars, and materials for railway construction, scientific instruments or things pertaining to education, seeds for planting, etc. There are export duties on the following native products: Coffee, peanuts, India rubber, copal, palm oil, ivory nuts and sesamum. Direct taxes are levied on land covered by or attached to buildings; on the number of employees and servants; and on steamboats, sailing vessels and row boats. The government also taxes the India rubber, having proprietary right in the production of that article. There is a tax of 10 francs on each contract for personal labor and 100 francs for a general permit to employ any number of employees. There are no restrictions on the foreign merchant except in regard to the importation of firearms, which is absolutely prohibited and the sale of intoxicating liquors which is limited by law to certain districts in the State. It is not permitted moreover to trade in the production of the State forests or public domain without securing a special concession.

History.—The Congo Free State took the place of the so-called Congo International Association. Upon its recognition at the International Conference at Berlin February 26, 1885, it formed treaties with other nations and acted in all ways as a sovereign state. In 1890 as the result of an international conference at Brussels the government of the Congo Free State was authorized to levy certain duties on imports. The King of the Belgians who had acquired full sovereignty over this country bequeathed by will his sovereign rights to Belgium in 1889. In 1890 the Belgian government declared the territory inalienable and reserved by agreement with the Congo Free State the right of annexation after the year 1900. The power of the Arabs in Kasongo where the notorious slave dealer, Tippu Tib, has long held sway was overthrown in 1892. The military operations in the country have added greatly to the expense of the administration, and besides the annual subsidy from King Leopold, the Belgian government has voted a considerable sum to supplement the revenue. The Dervishes have caused the local authorities a great deal of trouble, and in December 1896, an expedition under Captain Chaltin entered the country of the Mahdists and on February 17 attacked a force of about 2,000 who held a strong position. The Mahdists were put to rout abandoning their baggage and ammunition. A still larger force of Mahdists, however, blocked the progress of the Congo troops at Rejaf, but the latter were again successful and gained another supply of spoils from the retreating enemy. The effect of this expedition was to rid this portion of the country of the Mahdists and to extend the authority of the Congo government. But in the meanwhile the government had suffered a set-back through the mutiny of certain native troops who had been impressed into the service of the State. These consisted chiefly of the tribe known as Batatelas, who were treated with severity by their officers and had a further grievance in the fact that they had been led to fight at a long distance from their homes. They revolted in February 1897, and killed their commander. They were joined by other rebels and a considerable force succeeded in making their escape and in carrying off a large supply of guns and ammunition. They passed to the southward and were repulsed with difficulty from an attack on an English fort in which the small garrison was aided by Congo State troops.

Criticism of Official Methods.—The missionaries tell a different story of the effects of Belgian rule on the Congo from that which is given out by the administration. The treatment of the natives is said to have been cruel in the extreme and the State is charged with having itself engaged in the slave trade which it has ostensibly suppressed. The atrocities practised by the black troops in the interior have been made the subject of frequent complaint. The missionaries say that in one district of the Upper Congo over forty villages were burned by native soldiery and that it is a common thing to see baskets full of human hands taken as trophies to the authorities to show that the troops are not negligent of their duties. According to the missionaries, neither women nor children are spared and this terrible punishment is inflicted not for rebellion or for crimes against the State, but merely for failure to supply the requisite quantity or quality of rubber as tribute. The missionaries complained that their charges either received no attention at all or led to threats of punishment on the ground that they were trying to incite the natives to withhold the tribute of rubber. But some of these reports reached the home authorities and the Governor-General of the Free State afterwards made some efforts to put a stop to the abuses and to punish the offenders. It is difficult to obtain a trustworthy account of this matter. The authorities of the Free State claim that the administration has done a great deal to improve and civilize the natives and they cite among other instances of this, the suppression of the slave trade, the building of roads and railways, the establishment of a flotilla on the river, the development of trade, the fostering of industries, and the moral and intellectual improvement of the race through education. On the other hand it is said by some that some of the most evil practices of the savages are still carried on. It is even maintained that cannibalism has increased rather than diminished under the European rule, notwithstanding that it is a crime according to the laws of the State.

Recent Progress.—In 1898 public attention was drawn to the Congo Free State by the opening of the railway from Matadi to Stanley Pool through the cataract region early in July. In October 1898, Mr. Demetrius C. Boulger wrote an interesting review of the work on the Congo during the last twelve years. Some of the points which he brings out are worthy of mention here. In the first place he maintains that the credit for such progress as has been made in the Free State belongs wholly to the King of the Belgians, Leopold II, from whose private purse have come the revenues which enabled the work of civilization to begin, and to be carried through its earlier stages on the Congo. The Berlin Conference above mentioned did little for the State beyond giving it a name. In fact it hampered it from the first by imposing on it complete freedom of trade,—a measure which deprived it of an important source of revenue. At the same time the conference laid on the Free State the duty of suppressing the slave trade. None of the signatory powers gave the little community any aid in carrying out this latter purpose. Naturally the means at its own disposal

were inadequate. The Arabs gained the district around Stanley Falls and Tippu Tib set up his slave empire there. In 1889 a new conference was held in Berlin to take measures for the abolition of the slave trade in Central Africa. In the following year an anti-slavery conference met at Brussels and while it increased the obligations resting on the Free State, it sanctioned measures for procuring revenue. Up to that time the means for withstanding encroachments of the slave power had been supplied from the private purse of Leopold. Now, however, the Free State secured the right of levying an import duty up to 10 per cent. The increase of its revenue enabled the State to carry this war against the Arabs to a successful issue. The region where a few years ago every atrocity connected with the slave trade was committed with impunity, is now restored to freedom under the flag of the Congo Free State, and this victory was gained without the aid of other powers. The downfall of the Arabs was now complete, but that was not the end of the petty but exhausting warfare which the government of the Congo had to carry on. We have already seen that on the very day when the dervishes were routed at Rejaf the Batetela contingent of the native army broke out in revolt. In order to suppress this mutiny the Belgian authorities had to make a further sacrifice of lives and money; but the work was virtually completed in 1898. The Congo State troops were successful in several engagements with the mutineers and in the autumn of 1898 the power of the latter seemed to be utterly broken.

In works of peace, the progress of the Congo government has been even more important. These wars were necessary for the suppression of the slave trade. Their successful issue enabled the government to enforce the clauses in the penal code making cannibalism and the capture of slaves capital offenses. The suppression of barbarous practices was followed by attempts to civilize the blacks. The import of firearms was checked and efforts were made to control the liquor traffic. It had formerly been asserted that the authorities were engaging in the liquor trade for their own benefit; but this charge does not appear to be borne out by the facts. On the Lower Congo the Portuguese, English, and American merchants were already carrying on a liquor traffic when the Congo government was established and treaty conventions prevented it from suppressing this trade. It appears to have done all that was in its power to do, that is it levied as high a duty as possible on the importation of liquors. On the Upper Congo, however, where it had a free hand, the government prohibited the importation of liquors within certain defined districts. The entire line of the railway is included in these districts. Where the trade is permitted, it is subject to very strict regulations, limiting the sale to Europeans under heavy penalties. The law forbids a merchant to use alcohol for purposes of barter with the natives, and dealers are required at regular intervals to render detailed accounts of the quantities sold and of the names of the purchasers.

Among the other measures which have been taken for the elevation of the negro is that which relates to labor contracts. The effort has been made to prevent the making of such contracts as would in reality reduce the black to a position of servitude. It is said that so far as the relation of employee to employer is concerned, the black laborer is better off than the European workingman. The law renders contracts inviolable and requires that the black laborer shall know the precise terms of his engagement. When an employer engages him to work at a distance from his home he is bound to send him back free of expense.

In many other ways the Belgian officials have tried to improve the condition of the natives. There are many evidences of a kindly feeling between the two classes. During the recent expeditions there were many incidents which bore witness to the devotion of the black troops to their white officers—a devotion which would hardly subsist if the reports of official cruelty were well grounded.

As to the financial and commercial development of the Congo Free State it should be noted that while in the first year of its existence its revenue was less than £3,000 it had risen in 1897 to £367,334. During the early history of the State the revenue represented but a small fraction of the expenditure, the bulk of the latter having to be met by the King's subsidy, loans from the Belgian government and other outside sources. In 1897, 68 per cent. of the expenditure was met from the revenue of the Free State, notwithstanding the exceptional expenses of the military operations and the cost of telegraphs and other works of improvement. Commerce has also developed with great rapidity notwithstanding the fact that it is only in recent years that the railway has supplied facilities for transportation. The export of the Congo Free State rose from about £70,000 in 1886 to £600,000 in 1897. The resources of the country have by no means been fully developed. New fields for productive labor are being opened, notably in the cultivation of coffee and cocoa. It is expected that the efforts to improve the native labor will result in far greater productive efficiency, and it is said that a period of increased prosperity has already begun. These are among the blessings which the writer above mentioned emphasizes as the result of Belgian activity on the Congo. Another point worth noting is the fact that this region is held by a neutral pacific power indisposed to aggressive measures and un-

likely to complicate the problems of African politics. It is a government moreover which is pledged to the policy of the "open door."

CONGREGATIONALISM. See CONGREGATIONALISTS.

CONGREGATIONALISTS, originated in the English Independents. The national council was held at Portland, Ore., in July 1898, the first general meeting on the Pacific Coast, and its tenth triennial session. Missionary funds were not as generously provided as in previous years, but the work of missionaries in India and China was most successful, and much is expected of the missions in the Caroline Islands. The next International Congregational Council will be held in Boston in September 1899, and the next triennial meeting in Portland, Me., in October 1901. There are at present 5,614 churches, 5,475 ministers, and 625,864 members. The latest report of the Commissioner of Education shows that the Congregationalists control 24 institutions of higher education, with 442 teachers, 4,070 students, and endowment funds amounting to \$8,219,495.

CONGREGATIONAL METHODIST CHURCH, organized in 1852 in Monroe county, Georgia, has its operations chiefly in the South. In 1898 this church reported 240 churches, 210 ministers, and 12,500 members, showing a very slight increase since 1894-5.

CONGREGATIONAL NATIONAL COUNCIL, composed of delegates from the Congregational churches, organized in 1871, meets once in three years. Its next meeting will be held in Portland, Me., in October, 1902. Officers: Rev. Frederick A. Noble, Moderator; Rev. H. A. Hazen, Auburndale, Mass., Secretary; Rev. S. B. Forbes, Treasurer; and Rev. W. H. Moore, Registrar.

CONGRESS OF THE UNITED STATES. See UNITED STATES.

CONGRESSIONAL LIBRARY, founded in Washington in 1800, was destroyed at the capture of Washington in 1814, after which Thomas Jefferson gave his library as a nucleus. The new library building was opened to the public Nov. 1, 1897, and has remained open every day with the exception of Sundays and legal holidays from 9 A. M. to 10 P. M. Many improvements in the efficiency of the service were made during 1898; books are delivered to the readers at numbered desks; and by means of a tunnel and railway books are also delivered to the branch office in the Capitol building. From Nov. 1, 1897, to Sept. 1, 1898, there were 63,493 visitors; from January, 1898, to September, 1898, 103,711 books were supplied in the reading rooms, and 15,509 books were taken from the library. In 1898 the Chinese books (mainly derived from the library of the late Caleb Cushing, the first American Envoy to China), were catalogued by means of the courtesy of His Excellency Wu Ting-fang, the Chinese Ambassador to Washington, who permitted some members of his staff to do the work. This collection consists of 237 standard works—classics, history, poetry, medicine, fiction, etc.; and 2,547 Keuns (unbound volumes). There are a few duplicates. Several bulletins—one on Cuba, one on maps of the Northwest from 1588 to 1898, and one on the Philippines (prepared by the Peace Commissioners in Paris), were published. The laws on copyright were compiled, condensed, and issued in the form of a bulletin. The copyright fees earned and paid into the treasury for 1897-98 amounted to \$55,926,501, of which \$45,711 were for American books and articles and \$8,842 for recording the titles of foreign works. A gallery of rare Americana was opened during the year. The prints collected by the late Gardiner Greene Hubbard were given to the library by Mrs. Hubbard in March. A pavilion for the blind was opened in the new library, containing books, periodicals, and music in raised letters, obtained partly by copyright, by gift, and by purchase. It contains 219 volumes; 50 sheets of music; 40 maps and charts; 78 magazines; and 166 weeklies. Daily readings are given here. A reading-room for children was also set apart, with about 12,000 volumes. A mail and supply department was also created.

The report for the year ending June 30, 1898, gives the expenditures as \$126,243.01, of which \$114,744.38 were for salaries; \$9,498.63 for the purchase of books, etc.; and \$2,000.00 for contingent expenses. The additions were chiefly "to fill gaps," especially in the way of periodicals and newspapers, for it is proposed to have a complete set of every periodical mentioned in Poole's Index. Another aim is to have full sets of an author's works. Especial attention is being given to American literature and Spanish publications, especially in the departments of history, jurisprudence, and geography, particularly what concerns the Antilles and Philippines. Some historical and bibliographical purchases were made in Germany and France. An appropriation of \$15,000 was given to increase the departments of the library. There are now 832,107 books, with 126,985 copyright deposits (duplicates), and 226,972 pamphlets. The growth in 1898 was: 25,472 volumes (to which should be added 5,832 volumes in the Smithsonian deposit); 2,646 periodicals; 1,388 maps and charts; 5,024 art books and prints; 47 MSS.; 556 law-books; and 10,848 volumes and pieces of music, making in all 45,981 additions. The President's nomination of Samuel J. Barrows for Librarian to succeed the late John Russell Young, was not accepted.

CONIFERÆ. See BOTANY.

CONNECTICUT. One of the New England States of the United States, with an area of 4,990 sq. m. Capital, Hartford.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 1,657,785 bushels, \$862,048; wheat, 6,000, \$5,280; oats, 562,562, \$202,522; rye, 259,056, \$155,434; buckwheat, 65,759, \$36,825; potatoes, 2,530,000, \$1,391,995; and hay, 616,714 tons, \$6,876,361—total value, \$9,530,385. Live-stock comprised, horses, 43,682; milch cows, 143,098; other cattle, 60,588; sheep, 31,745; and swine, 54,165—total head, 339,278.

Industries.—The annual report of the Bureau of Labor Statistics issued in 1898 compares the results of an examination of 768 manufacturing establishments on July 1, 1896 and 1897. The number of persons on the different payrolls was 88,934 in 1896 and 87,907 in 1897; amount paid in wages, \$40,404,002 in 1896 and \$36,271,729 in 1897; average hours of labor in all establishments in both years, 56 per week. The report also gives details concerning 200 selected employes engaged in a variety of industries. The average rate of wages was \$12.65 per week; annual cost of living 73.7 per cent. of possible earnings; average annual cost of living per member of family, \$154. Of the whole number 47 were house-owners, 125 were rent payers, and 28 paid neither rent, interest, nor taxes. There were upward of 1,450 factories in operation, employing over 136,000 persons. Connecticut and Rhode Island constituting a single United States internal revenue district under the name of the first, it is impossible to give a correct review of Connecticut's great tobacco interests. In the calendar year 1897 there were credited to the revenue district 138 dealers in leaf tobacco, 61 general manufacturers, 493 cigar manufacturers, and an output of 41,740,996 cigars, 372,050 cigarettes, and 26,267 pounds of smoking tobacco. It is safe to assume that the greater part of these figures belong to Connecticut.

The annual report for 1898 of the Bureau of Labor Statistics (Jan. 3, 1899) gives returns from 564 manufacturing establishments, which in 1898 employed 15,669 persons, an increase of six per cent. over 1897. Wages disbursed were \$32,498,059 or 14.6 per cent. more than in 1897. The cotton goods factories show 1,094,068 spindles, as compared with 951,007 in 1890, an increase of 15 per cent. Wages took 31.1 per cent. of product value, as compared with 29.4 per cent. in 1890. Ten per cent. of the workers were boys and girls under 16 years of age. The value of woollen goods produced was \$11,887,227, paying 22 per cent. of product value in wages. Knit goods were valued at \$3,630,550, wages being 26.7 per cent. of product value and silk goods \$7,488,485 with 23 per cent. wages. The textile industries employ 31,535 persons, 15,493 being women.

There are 139 trade unions in the State. Of these 105 have a membership of 9,298 men and 1,439 women. Only twelve strikes have occurred in their history, which, in the case of some of the unions, reaches back to the year 1850.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise at the ports of Hartford, New Haven, New London, and Stonington amounted in value to \$479,362, a decrease of over \$680,000 in a year; exports, nothing, same as in previous year.

Banks.—On October 31, 1898, there were 80 national banks in operation and 18 in liquidation. The active capital aggregated \$21,281,070; circulation, \$8,469,557; deposits, \$38,893,049; and reserve, \$11,495,422. The State banks, October 1, 1897, numbered 8, and had capital \$2,240,000, deposits \$5,692,909, and resources, \$9,435,142; loan and trust companies, same date, 12, with capital, \$1,245,000, deposits, \$6,091,167, and resources \$8,307,407; and mutual savings banks, same date, 89, with depositors, 36,661, deposits \$155,969,798, and resources \$166,175,213. The exchanges at the United States clearing houses in Hartford and New Haven in the year ending September 30, 1898, aggregated \$205,030,688, an increase of \$8,142,997 in a year.

Insurance.—In 1898 there were 37 insurance companies of various kinds operating under State charters. Of these, 8 were fire companies, reporting capital \$10,150,000, and surplus \$13,200,563; 9 were life companies, 7 of which reported aggregate assets \$151,588,275; 17 were mutual fire companies, 14 of which reported aggregate surplus \$1,677,701; and 3 were miscellaneous companies, one of which reported assets \$2,237,638, and two an aggregate surplus \$3,404.

Education.—At the close of the school year 1896-7, the enrollment in the public schools was 143,921; average daily attendance 101,063; number of teachers, over 4,000; value of public school property \$9,344,690; and expenditures \$2,959,825, including \$1,837,518 for teachers' salaries. There were 64 public high schools, with 279 teachers and 6,126 pupils; 58 private secondary schools, with 164 teachers and 2,684 pupils; 3 public normal training schools, with 79 teachers and 527 students; 3 colleges and universities, co-educational and for men only, with 194 professors and instructors and 2,398 students, a school of technology, with 12 instructors and 107 students; and a law, a medical, and three theological schools. There were 189,728 children of school age in Connecticut in October 1898, being an increase of 5,392 over October 1897. This increase indicates a total increase of population in the State

for that period of about 25,000. The Storrs Agricultural College at Storrs Station, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. The law prohibiting child labor in factories and sanctioning the employment of agents having power to compel school attendance, has yielded excellent results. The increase in attendance has gone beyond the increase in enumeration, notwithstanding the withdrawals to private schools. Details of the public school fund on September 30, 1897, showed investments in bonds and mortgages, bank stock, and real estate, with cash in the State treasury, aggregating \$2,007,080, and net income for the year \$112,477. In 1898 there were 201 periodicals, of which 50 were dailies, 109 weeklies, and 27 monthlies.

Churches.—Reports of the principal denominations for 1897 are summarized as follows: Baptist, 140 churches, 118 settled pastors, 24,243 members; Congregational, 323 churches, 256 pastors, 62,456 members; Protestant Episcopal, 151 parishes, 36 missions and chapels, 221 clergy, 30,140 communicants; Roman Catholic, 186 churches 96 stations and chapels, 233 clergy, 250,000 estimated Roman Catholic population.

Finances.—Receipts for the year ending September 30, 1897, \$2,382,373; expenditures \$2,550,080; total funded debt, \$3,240,200, assets \$123,028, net debt, \$3,117,172; assessed valuation \$534,465,257—the highest in more than ten years. The legislature in 1897 made important changes in the provisions regulating the investment of savings banks deposits, a notable one being the provision that “when any loan or investment is made by a savings bank, the names of the directors or trustees consenting thereto shall be entered upon the records of said bank.”

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 865,000. Local estimates gave New Haven, 112,000; Hartford, 72,000; Bridgeport, 66,000; Norwich, 25,000; Stamford, 20,000; and Middletown, 17,000.

Sociology.—The constitutional provision of 1897 that all voters must be able to read in the English language, and adopted by an overwhelming majority of the popular vote makes the following statistics interesting: In 1897, 8,791 children of native parents were born in the State and 8,286 of foreign parents, and while 11,225 American-born citizens died only 3,487 deaths occurred among the foreign-born. Of the total births only 41.2 per cent. were of native parents; 58 per cent. were of parents, one or both of whom were foreigners.

The philanthropy of Connecticut has been somewhat remarkable. The report of the State Board of Charities for the year ending September 30, 1898, showed that the Board visits 176 institutions for the care of the delinquent, defective, and dependent classes. This number includes eighty-eight almshouses and the amount of State aid given during the year was \$658,190. Recommendations are made for the appointment of a State commissioner of prisons, a State commission in lunacy, a State reformatory for women, and a separate cottage department for epileptics at Lakeville. There were 64 convictions in 1898 for violations of the fish and game laws. There were 93,450 shad caught in State waters, the largest for ten years, and 20,093 more than in 1897.

Harbor Improvements.—Great interest was manifested in the harbor improvements, a natural consequence of the war. The Navy Department purchased Napatree Point, off Stonington, where important fortifications will be erected. This point commands Stonington Harbor, Block Island, Watch Hill, and waters east of the Race, and a battery there will be of great service to the batteries on Great Gull and Fisher's Island. Connecticut's improvements of rivers and harbors for the year ending June 30, 1898, show that no less than 5,755 cubic yards of rock were removed from Pawcatuck; 99,225 cubic yards of material from the Connecticut river; 53,355 from the Housatonic River; 137,700 cubic yards by dredging at Bridgeport; 67 tons of rock from the channel at Saugatuck; 21,956 cubic yards of material from Five-Mile River Harbor, and 35,000 cubic yards of mud were removed from Greenwich Harbor. Here a channel 6 feet deep, 45 feet wide, and half a mile long was made. Three breakwaters were nearly finished at Duck Island; but the proposed work in connection with the building of a harbor of refuge at the entrance of New Haven Harbor was not carried out. Channels were made in Stamford Harbor and the harbors of Cos Cob and Mianus were improved.

The "Charter" Discovery.—Some excitement was aroused by the Rev. W. De Loss Love, corresponding secretary of the Connecticut Historical Society discovering that what has long been supposed to be the original Connecticut charter is but a copy. The matter was referred to Mr. Hubert Hall, an antiquary of London who considers it unauthentic. Mr. Love accepts his testimony and will discuss the matter in a forthcoming book. Some members of the Connecticut Historical Society think this parchment which is now hanging in the Secretary of State's office in Hartford, is the charter revoked in 1685 by James II, and which was hidden in the old Charter Oak by Joseph Wadsworth, and which, brought forth in 1688, made the law for Connecticut from 1688 to 1818.

Elections and State Officers.—The State convention of the Republican party was peculiarly ardent. In the elections Gov. Lounsbury received 81,018 votes, having a

plurality of 16,738. The delegates to the House of Representatives are: E. Stevens Henry (Rep.), from Rockville, Nehemiah D. Sperry (Rep.), from New Haven, Charles Russell (Rep.), from Dayville, and E. T. Hill (Rep.), from Norwalk. The Senators are: Orville H. Platt (Rep.), from Meriden, and a Republican. Officials: George E. Lounsbury, Governor; Lyman A. Miles, Lieutenant-Governor; Huber Clark, Secretary of State; Charles S. Messick, Treasurer; Thompson S. Grant, Comptroller; George Haven, Adjutant-General; and F. A. Betts, Insurance Commissioner, all are Republicans. Chief Justice, Charles B. Andrews (Rep.); Associates, David Torrence (Rep.), Frederick B. Hall (Rep.), Simeon E. Baldwin (Dem.), and William Hammersley (Dem.); and Clerk, George A. Conant. In the State legislature there are 200 Republicans and 76 Democrats.

CONSTANTAN, See PHYSICS (paragraph Boiling Point of Ozone).

CONSTITUTION OF MATTER. See PHYSICS (paragraph Potential Matter and Vortex Motion).

CONSUMERS' LEAGUE. The objects of this organization may be summarized from the constitution of the Consumers' League of Pennsylvania. This document states that the purpose of the organization is first to improve the condition of women and children in retail stores patronized largely by women, second to obtain from retail merchants information and advice with a view to establishing a practical standard of a "fair house," to which these merchants will be asked to conform; and thirdly to place in the hands of the greatest possible number of consumers a list of the stores in which the greatest number of conditions are known to conform to such a standard. Thus it is thought to place the responsibility for the condition of the employees in retail shops on the consumers. It is held that the latter should give their support to those employers who treat their employees with fairness and consideration. It is recognized that under the pressure of competition the employer is often driven to impose hardships on his employees. As an offset to this tendency the Consumers' League tries to increase the custom of such employers as show some consideration for the comfort of their employees in spite of such competition. To do this it publishes what is known as a "white list," giving the names of the "fair houses." The qualifications which entitle a retail store to be placed upon the list have to do especially with wages, hours, and physical conditions. The New York Consumers' League requires that equal wages shall be given for work of equal value irrespective of sex, that wages shall be paid by the week; that in departments where women only are employed the minimum wages shall be \$6.00 per week and rarely below \$8.00; and that when fines are imposed they shall be paid into a fund for the benefit of the employees. As to hours, it is held that a "fair house" is one in which the hours are from 8 A. M. to 6 P. M. with three-quarters of an hour for lunch, and one-half holiday once a week at least during two summer months. Further qualifications are the giving of a vacation of not less than one week with pay in the summer season, and the compensation of all over time work. As to physical conditions, it is required that they shall conform in all respects to the present sanitary laws and that measures shall be taken to promote the comfort and convenience of the employees, such for instance as the placing of seats behind counters and permitting their use. It is further demanded that no children under fourteen years of age shall be employed.

CONSUMPTION. See TUBERCULOSIS.

COOLEY, THOMAS MCINTYRE, a prominent jurist and constitutional lawyer, died at Ann Arbor, Michigan, September 12, 1898. He was born at Attica, New York, January 6, 1824; settled in Michigan in 1843 and three years later was admitted to the bar. Having compiled the general statutes of the State, he became in 1858 reporter for the Michigan Supreme Court and held this position for six years; he published eight volumes of reports and a digest of the Michigan decisions. He became a professor in the law department of the University of Michigan in 1859 and subsequently dean of the faculty. He was elected judge of the State Supreme Court in 1864, and again in 1869 and 1877 for terms of eight years, being chief justice 1868-69. Upon the establishment of the department of political science in the University of Michigan in 1861, Judge Cooley became professor of constitutional and administrative law; he was also dean in this department and occupied the chair of American history in the school of arts. For three years he lectured on law at Johns Hopkins University. President Cleveland appointed him a member of the Interstate Commerce Commission, of which he became the chairman (1887); he retired in 1891 on account of ill health. His publications on legal subjects have been accorded high rank; among them are: *The Constitutional Limitations which rest upon the Legislative Power of the States of the American Union* (1868); *Blackstone's Commentaries* (1870); *Story's Commentaries on the Constitution of the United States, with Additional Commentaries on the New Amendments* (1873); *Law of Taxation* (1873); *Law of Torts* (1879); *General Principles of Constitutional Laws of the United States* (1880); *Michigan, a History of Government* (1885). Judge Cooley wrote most of the articles on law in Appleton's *American Cyclopaedia*.

COOPER, THOMAS SIDNEY, R. A., died 1898. He was born at Canterbury, Eng-

land, September 26, 1893; his early life was largely a struggle against adverse circumstances, but in 1823, through the influence of Sir Thomas Lawrence, he entered the Royal Academy school. For a time he was a drawing master at Canterbury, and then went to Brussels, where he studied (1827-30) under Verboeckhoven, the animal painter, and achieved considerable success in his art. He first exhibited at the Academy in 1833; in 1845 he became an A. R. A. and in 1867 an R. A. As a painter of animals he is said to be supreme, and his works have probably been copied more than those of any other artist of his time. He took much interest in his native town and in 1882 presented it with a gallery of art. In 1890 he published a book of reminiscences entitled *My Life*. Among his best pictures are "Cattle Reposing" and "King of the Meadows."

COOPER UNION FOR THE ADVANCEMENT OF SCIENCE AND ART, an educational institution at the junction of Third and Fourth avenues, New York City, founded in 1857 by Peter Cooper, gives free instruction in science and art, stenography, typewriting and telegraphy, has a free library and gives courses of free lectures on popular topics. It has a well equipped museum for the study of the art of decoration, a free library of 34,702 vols., and reading room, and has day and evening classes. In 1897 there were 40 instructors, 4,672 students in the various courses. It has a permanent endowment fund of \$1,515,508. President, Edward Cooper. See HEWITT, ABRAM S.

COPPER. Production.—The production of copper in 1898 showed a marked increase over that of 1897, as will be seen from the following figures: 1897, 510,190,719 lbs; 1898, 546,367,793 lbs.

The States of Montana, Michigan, and Arizona, were the three leading producers, and their product showed respectively a decrease of 7.5 per cent., an increase of 8.9 per cent., an increase of 37.2 per cent. The higher price of copper caused the increased production. The United States furnished over 60 per cent. of the world's supply during 1898, and 56 per cent. of the American production was exported. The important foreign sources of copper ore are the Rio Tinto District in Spain, the Mansfield District in Germany, Southern Africa, Newfoundland, British Columbia and Mexico.

Metallurgy.—The chief methods used for the treatment of copper ores in the United States continue to be matte smelting, single fusion in the blast furnace, and electrolytic refining. The second is still used in the Arizona districts for smelting the oxydized ores, but matte smelting is slowly superseding it as the unoxydized sulphide ores are encountered, and this latter method is the one most used in the United States. Much copper is refined electrolytically and the *Mineral Industry* for 1897 contains an excellent article on this subject.

The Copper Plant.—In Queensland there has been discovered a plant which nearly always grows in a soil that contains copper and is therefore used as a means of finding this metal. Its name is *Polycarpæ Spirostylis* and it has been called the copper plant. It occurs over the entire copper region of Queensland, but more especially close to deposits of that metal or in water courses which are impregnated with the solution of copper. Its chemical analysis by the government chemist Brownly Henderson shows that it contains a large amount of copper, a quantity much above that which could be accounted for as a result of accidental absorption.

COREA, an Asiatic kingdom formerly tributary to China, but since the Treaty of Shimonoseki of May 1895, independent, has an estimated area of 82,000 square miles, with a population variously estimated from 8,000,000 to 16,000,000. In 1897, the foreign element consisted of 10,000 Japanese, 4,000 Chinese, and about 3,000 of other races. Seoul is the capital with about 200,000 inhabitants.

Commerce.—Corea is almost wholly an agricultural community, but in recent years its commerce has greatly increased. The year closing December 31, 1897, is said to have been more prosperous in respect to foreign trade than any year preceding. The U. S. Consular Report dated August 1898, states that the total net trade of Corea for the previous year was almost double the highest figure it had previously reached. The increase of commerce was very marked even during the war between Japan and China which was waged largely on Korean soil, the large amount of money spent by the Japanese troops there having supplied the Koreans with a purchasing medium. After the war many Chinese merchants came to Corea and aided in the development of trade. Another thing which promoted foreign commerce was the comparative failure of the Japanese harvests of rice at a time when the Korean harvests were good. Then in 1897 the Korean government spent large sums for public works. In 1897 the imports amounted to about \$5,000,000 and the total exports, including over \$1,000,000 in gold, to \$5,504,006. The coast trade was especially active during 1897. The Consular Reports do not show how the trade with Corea is shared among foreign nations, but it is estimated that of the imports a larger amount consisted of English manufactures than of the products of any other country, and the greater part of the English manufactures imported were cotton goods. Cotton goods, in fact,

seem to have been the chief article of import, a considerable supply being derived also from Japan. Besides this, there is an important trade in yarns with Japan, which also sends to Corea a considerable supply of matches. The German trade is chiefly in needles and aniline dyes. The United States in 1897 sent to Corea over \$232,000 worth of American kerosene. Besides this there was a considerable importation of American machinery. Of the exports the heaviest item is rice, which in 1897 amounted to nearly \$3,000,000. Next in importance were gold-dust, beans and ginseng. The foreign shipping is chiefly Japanese. In 1897 no American merchant ships visited Corea. Most of the goods for Corea are trans-shipped in Japanese or Chinese ports. Between Corea and the ports of China and Japan there are two important lines of steamships. There are a good many Korean coast steamers and the coasting trade has developed considerably of late. As to the opening of new ports, there were two opened in the autumn of 1897. In one of these was Chenampo in the north, the port of entry for the northern capital Peng Yang, the latter being the trading center of a fertile grain-producing and mining country. The other port opened at that time was Mokpo on the southwest coast, also opening up a rich country to foreign trade. In the summer of 1898 the government announced its intention of opening four more new ports to foreign trade. This would give Corea ten open ports, namely, Seoul, Chemulpo, Fusan, Genaan, Mokpo, Chenampo, Peng Yang, Sung Chin, Kuhn San, and Masampo. It was also said that a tract of land for a general foreign settlement was to be allotted on Deer Island in Fusan harbor, the Russian coaling station on Deer Island being located within its limits.

Production and Industries.—The chief crops are rice, wheat, beans, barley, millet, oats, and other grains; besides tobacco. Ginseng is a very important crop, this drug being highly valued by both the Koreans and the Chinese for its curative properties. It is exported in large quantities to China where there seems to be an almost unlimited demand for it. Its production is carried on around Songdo, the ancient capital. The mineral resources of Corea are considerable, including gold, copper, iron, and coal. Placer mining is the method followed for obtaining gold. A concession was granted to an American company for a gold mine at Wom San near Peng Yang, the northern capital. This scheme was reported at the close of 1897 as having made considerable progress. The Russians and Germans have also received mining concessions. The native miners are said to do their work well, to be content with low wages and easy to deal with. In 1898 it was reported that the prospects for trade were good. The rice crop during the summer of 1897 was somewhat deficient and the high price of rice in the autumn led to an attempt to prohibit its export. In the spring of 1898 the high price still continued, but there were signs of an intention on the part of the farmers to take advantage of it by the reclamation of new land. Korean manufactures are still undeveloped and none are made for foreign export. In some industries, however, the people show considerable skill; for instance, in the manufacture of paper and of brass and copper utensils, mats, blinds, fans, etc., all of which are made by hand. It has been said that the country is also well adapted for the culture of silk. The art of pottery has declined among the Koreans who once practiced it with incomparable skill. They taught the secret to the Japanese and for five centuries none of the finer ware has been produced in Corea. Compared to our standard of wages, the rates paid to the Korean workingmen seem very low. They are said to be only fifteen cents in gold per diem for unskilled labor. When the price of rice, which is the staple article of consumption, is at its average, it is quite possible for the Koreans to supply their simple wants at this rate of wages, since it is said that a man can support himself, his wife, and three children for a month on 140 pounds of rice, which formerly was worth \$3.00.

Finance, Currency, Railways, etc.—The main source of revenue is the land tax. The United States Consular Report for June, 1898, states that out of a total revenue of \$4,527,476, \$2,227,758 comes from this source. The tax is collected only from rice fields and lands cultivated for grain, especially from the former, and not from house lots or timber and pasture lands. There is a rough classification of the different kinds of rice land and the taxes are apportioned accordingly. The system of collection is still very primitive, the department of finance relying upon ancient surveys. It is said in a recent report that hundreds of poor people pay taxes on land which has been washed away. Copper coin is the prevailing form of currency in Corea. It is based theoretically on the silver dollar, equal in value to the Japanese yen but not coined at present. As Japanese paper and coin make up a large part of the Korean currency the adoption of the gold standard in Japan virtually placed Corea on a gold basis. The banking facilities are supplied by branches of large Japanese banking houses. In a Consular Report for August, 1898, it is stated that money is seldom loaned for less than 12 per cent. on good security. At Chemulpo there is a branch of the Hong Kong and Shanghai banking corporation and in the spring of 1898 the Russians opened the Russo-Korean Bank at Seoul, but closed it up in about a month on account of the change in the Russian policy toward Corea. Internal communications are still in a backward condition, although improvements

in the making of roads have lately been undertaken in the vicinity of the capital. On the Han river, between Seoul and Chemulpo, there are small steamers owned by Japanese. A railway has been begun by an American syndicate to connect Seoul with Chemulpo, and a French company has obtained a concession for a railway line from Seoul to the Chinese frontier. Telegraph communications are defective but there is a line joining Seoul with Fusan and Chemulpo, and a cable from the latter place to Nagasaki. Corea maintains a postal system.

Education.—Corean children are usually educated at home. A well-to-do family often employs a private tutor and the poorer families in some cases unite and employ a teacher for their children. Boys are instructed in the use of the Chinese characters and in the reading of Chinese classics, but girls are not as a rule taught to read. In 1898 it was reported that the Department of Education had under its direct charge ten schools, including one normal school with a curriculum comprising composition, reading, geography, arithmetic, history and dictation; and nine primary schools teaching the elements of the branches above mentioned and including a course in gymnastic training. There are also 21 local primary schools in the centres of population and to these the Department of Education grants a subsidy. From this it appears that the government work in the field of education is wholly inadequate. The foreign missionaries have done much to make up for this deficiency. The Americans, Japanese, English, French, and Russians have all done excellent educational work.

The American Methodist Church supports a flourishing school at Seoul and receives some assistance from the government. In 1898 it was reported that 176 were in attendance during the previous year. The school authorities aim not only to furnish education, but to supply employment to needy scholars and to teach them a trade. There is another American school at Seoul, and in this the attempt is made to train native teachers. In connection with it the government has founded a school in which the sons of nobles are taught the English language. The government maintains a Japanese language school in which the course of study extends over three years, and there is also a private Japanese school maintained by the Foreign Education Society of Japan. There is a very successful French school in Seoul with an extended and somewhat advanced curriculum. Perhaps the best of all of the foreign language schools, however, is that maintained by the English and opened in 1894. Chinese and Russian teachers have also opened schools in Corea.

Government and History.—Corea is now an independent monarchy, the reigning monarch who assumed the title of Emperor on October 15, 1897, being Heui Yi. His power is somewhat limited by the Cabinet, whose laws and resolutions, however, must be submitted to him for approval. There are eight executive departments, including the Cabinet, the Home Office, the Foreign Office, the Treasury, the War Office, Education, Justice, and Agriculture, Trade and Industry. China exercised suzerian rights over the country until the war with Japan 1894-95. As a result of that war she gave up her suzerainty and acknowledged the complete independence of Corea. For some time afterward the country was in an unsettled state. The Japanese would not leave until certain reforms were carried out by the Corean government, and their evacuation was not complete until October 1896. In that year and the next Russian intrigue was active and resulted in the appointment of a pro-Russian cabinet. Russian aggression was viewed with alarm both by the British and the Japanese. Late in the year 1897 there was a dispute between Great Britain and Russia over the control of the Corean finances. For years an Englishman named McLeavy Brown, in the capacity of superintendent of customs and financial adviser, had done much to improve the financial administration. Through Russian influence he was dismissed and a Russian nominee was chosen in his place. The British government refused to accept his dismissal and at last made a naval demonstration. The two governments reached a compromise by which Corean financial affairs were to be under the joint management of British and Russian customs agents. In the summer of 1898 Japan and Russia came to an agreement in relation to Corea. By this each power recognized the sovereignty and complete independence of the Corean Empire. The text of the protocol as published in the United States Consular Reports of August 1898, is as follows:

"In accordance with the provisions of Article IV of the protocol signed at Moscow on June 9 (May 28), 1896, by Marshal Marquis Yamagata and Prince Lobanow, Secretary of the State, it is hereby agreed by Baron Nissi, His Imperial Japanese Majesty's Minister for Foreign Affairs, and Baron Rosen, Counselor of State, etc., Envoy Extraordinary and Minister Plenipotentiary of the Emperor of all the Russias, having been duly authorized thereto by their respective governments.

"I. That the governments of Japan and Russia, recognizing the sovereignty and complete independence of Corea, shall in no way directly interfere with the domestic government of that country.

"II. That in order to avoid misunderstandings in the future, whenever either Japan or Russia is applied to by Corea for advice or assistance, neither contracting party

shall take any steps toward the appointment of military instructors or financial advisers without previous consultation with the other.

"III. That Russia, recognizing the great progress made in commercial and industrial enterprises by Japan in Corea, and the great number of Japanese subjects residing in the settlements, will do nothing to injure the development of the commercial and industrial relations between Japan and Corea."

CORINTH. See **ARCHÆOLOGY** (paragraph Greece).

CORN. The following table published by the department of Agriculture shows the acreage, production and value of corn in the United States in 1898.

States and Territories.	Area. Acres.	Production. Bushels.	Value.
Maine	10,893	435,720	\$209,146
New Hampshire	23,823	976,743	449,302
Vermont	46,142	1,984,106	873,007
Massachusetts	39,091	1,563,640	766,184
Rhode Island	7,730	262,820	168,205
Connecticut	44,805	1,657,785	862,048
New York	474,895	15,671,535	6,738,760
New Jersey	252,293	9,334,841	3,733,936
Pennsylvania	1,221,355	45,190,135	18,076,054
Delaware	208,784	5,219,600	1,618,076
Maryland	585,935	18,163,985	6,357,395
Virginia	1,761,662	38,756,564	13,564,797
North Carolina	2,433,600	34,070,400	14,650,272
South Carolina	1,751,907	17,519,070	8,058,772
Georgia	2,954,072	26,586,648	12,761,591
Florida	471,608	4,244,472	2,122,236
Alabama	2,645,442	39,681,630	16,269,468
Mississippi	2,218,393	39,931,074	15,573,119
Louisiana	1,319,915	23,758,470	9,740,973
Texas	4,213,468	105,336,700	35,814,478
Arkansas	2,268,261	45,365,220	13,155,914
Tennessee	2,941,067	76,467,742	22,175,645
West Virginia	700,994	20,328,826	7,521,666
Kentucky	2,747,653	85,177,243	22,997,856
Ohio	2,779,147	102,828,439	27,763,679
Michigan	980,606	33,340,604	11,335,805
Indiana	3,587,627	129,154,572	32,288,643
Illinois	6,665,327	199,959,810	49,989,952
Wisconsin	1,009,355	35,327,425	9,891,679
Minnesota	954,125	30,532,000	7,327,680
Iowa	7,285,710	254,999,850	58,649,966
Missouri	5,951,211	154,731,486	41,777,501
Kansas	8,302,628	132,842,048	34,538,932
Nebraska	7,559,746	158,754,666	34,926,027
South Dakota	1,003,927	28,109,956	6,465,290
North Dakota	24,308	461,852	166,267
Montana	1,598	44,744	29,531
Wyoming	2,477	39,632	21,798
Colorado	172,994	3,113,892	1,245,557
New Mexico	24,258	509,418	285,274
Arizona .....	.....	.....	.....
Utah	8,053	169,113	101,468
Nevada .....	.....	.....	.....
Idaho .....	.....	.....	.....
Washington	5,700	68,400	28,728
Oregon	13,656	327,744	196,646
California	45,540	1,184,040	734,105
Oklahoma .....	.....	.....	.....
Indian Territory .....	.....	.....	.....
Total	77,721,781	1,924,184,660	\$552,023,428

CORNELL UNIVERSITY, at Ithaca, New York, was incorporated in April 1865, and opened in October 1868. It is non-sectarian and co-educational. President, Jacob Gould Schurman, Sc. D., LL. D. The officers of instruction number 281. The departments of the university, with the student enrollment for 1898-99, are as follows: Graduate department, 173; academic department, 616; college of law, 162; college of agriculture, 74; State college of veterinary medicine, 23; college of archi-

lecture, 45; college of civil engineering, 186; Sibley college of mechanical engineering, 492; the medical college, 274; State college of forestry, 3; total, deducting for 10 names counted twice, 2,038. The following degrees were conferred in June 1898: A. B., 42; Ph. B., 44; B. L., 3; B. S., 57; B. S. in Agr., 9; V. S., 4; B. Arch., 9; C. E., 15; M. E., 87; LL. B., 105; M. A., 10; M. S., in Agr., 5; M. C. E., 3; M. M. E., 2; LL. M., 5; Ph. D., 23. Only the degree A. B. will be conferred upon students of the academic department entering in or after 1897; and hereafter in place of the degrees, A. M., Ph. M., M. L., and Sc. M., the one degree, A. M., will be conferred, and in place of the degrees Ph. D. and Sc. D., the one degree Ph. D. will be conferred.

In 1898 the value of buildings and grounds was \$1,796,372 and of apparatus \$1,135,308; total funds, \$6,446,818; gifts, \$197,126; total income, \$583,050. The year 1898 was the most prosperous in the history of the university, having seen the completion of a hydraulic laboratory, the enlargement of two buildings, the endowment of an infirmary, the establishment of the New York State College of Forestry, with 30,000 acres of forest in the Adirondacks, under the administration of the university, and the establishment of the Cornell University Medical College. The medical staff is composed of ex-members of the staff of two other medical institutions of New York City. The course is four years in length, the first two of which may be taken by men students at either Ithaca or New York, but must be taken by women students at Ithaca; while the last two years must be taken by all students at New York. During the year 1898-99 the medical college has occupied a building in the grounds of Bellevue Hospital, New York; the permanent site will be on First avenue, between Twenty-seventh and Twenty-eighth streets.

Among the prominent appointments in the university faculty were those of Charles De Garmo to the professorship of the science and art of education, and of Austin Flint as professor of physiology. See PSYCHOLOGY, EXPERIMENTAL, and UNIVERSITIES AND COLLEGES.

CORONIUM. Concerning the new element coronium little is yet known. It occurs only, so far as known, in the atmosphere surrounding the sun and possibly near volcanoes. It is revealed by the spectroscope. It is supposed to be much lighter than hydrogen.

COSTA RICA, a republic of Central America, has an estimated area of 23,000 square miles and an estimated population of 268,000. Very few inhabitants of the rural districts are of pure Spanish descent. The pure Indian population numbers about 3,500. The annual immigration since 1894 has been 1,000; it is encouraged by the government. The capital is San José (pop. 25,000); other towns of importance are Heredia, Limón, Puntarenas, Alajuela, Cartago. The state religion is Roman Catholic, but there is complete religious toleration. Education is free and compulsory, and, unlike some of the Spanish-American countries, the government enforces the compulsory law. In 1897, besides five schools for higher education, there were reported 327 primary schools with an attendance of 21,913 pupils.

Government.—Costa Rica became independent in 1821. By the present constitution the executive authority is vested in a President elected for four years by electors chosen by popular vote (legal voters must be self-supporting). He is assisted by a Cabinet of four members presiding over the departments of the Interior, Finance and Commerce; Foreign Affairs, Education, Justice, and Worship; War and Marine. The President, reelected in November 1897, and inaugurated in June 1898, was Don Rafael Yglesias. The legislative power devolves upon a Chamber of Representatives who are elected in the same manner as the President for four years, and in a proportion of one representative to each 8,000 inhabitants. The number of representatives in 1895 was 32. Besides inferior courts and local justices, there are the Court of Cassation, two Courts of Appeal, and the Supreme Court of Justice. Men between 18 and 50 years of age are liable to military service. The army in time of peace numbers 600, with a national guard of 12,000, which, it is said, if need be can be increased to 34,000.

Finance.—Revenues and expenditures in pesos for fiscal years have been reported as follows:

	1895.	1896.	1897.
Revenue.....	6,123,872	6,528,975	7,435,611
Expenditure.....	6,121,493	6,187,927	6,697,327

The foreign public debt amounts to about \$9,740,000; of this the interest on \$7,173,250 is 2½ per cent. and on \$2,556,750 is 3 per cent. In 1897 the internal debt amounted to about \$1,095,750. The redemption of this amount is progressing rapidly. Costa Rica has two banks, with a capital of 1,200,000 and 2,000,000 pesos. Circulating paper in 1896 amounted to 3,300,000 pesos and the silver to 350,000 pesos. The silver peso at par is worth about \$0.975; the value of the paper peso is about \$0.45. In October 1896, the government adopted the gold standard and fixed the gold *colón* as the monetary unit, its value being \$0.465.

Industries and Commerce.—Agriculture is the principal occupation of the people, and coffee and bananas are the chief products. The soil is very fertile and almost any crop can be cultivated profitably. Attention is also paid to the raising of cattle. Parts of the country possess valuable gold and silver mines, but these at present are little worked. Coffee is the chief export, amounting in 1896 to over 197,000 bags, valued at 10,178,040 pesos. Other exports are cabinet woods and hides and skins. The principal imports are cotton, woolens, and iron goods. Imports and exports have been valued in paper pesos as follows:

	1894.	1895.	1896.
Exports	10,165,201	13,250,000	
Imports	12,183,609	12,218,550	12,153,592

The following statistics comparing the amount of exports from Port Limón and from Puntarenas during the first six months of 1897 and the corresponding period of 1898 are derived from the Director-General of Statistics at San José:

	1897. Kilos.	1898. Kilos.
Port Limón:		
Miscellaneous exports	152,386	184,710
Coffee, in parchment	1,794,874	4,428,149
Coffee, cleaned	10,139,879	11,168,992
Bananas	27,400,966	34,414,609
Reshipments	1,928	136,788
Total	39,490,033	50,333,248
Puntarenas:		
Miscellaneous exports	3,564,113	2,761,124
Coffee, in parchment		16,577
Coffee, cleaned	1,653,544	1,870,280
Bananas		
Reshipments	14,178	15,751
Total	5,231,835	4,663,732

An Important Mining Concession.—On February 23, 1898, the contract between the Ministry of the Treasury and the Abangeres Mining Syndicate (Limited) was approved by the Costa Rican Congress. The corporation, which agrees to open up the Abangeres mining region in the province of Guancaste, was given a fifty years' exemption from all federal taxation, except in cases otherwise provided for in the contract, and an exemption during the same time from import tariffs on such machinery and other commodities as may be necessary for furthering the enterprise. The company, however, is not exempt from the payment of general municipal taxes. According to the contract the government is to receive from the company one per cent. on the gross output of the mines during the first twenty-five years, and two per cent. during the remaining twenty-five. The company may construct such wharves, railways, telegraph and telephone lines, etc., as it may consider to be necessary, but it must transport free of charge over its railways public officials and, in case hostilities should arise, munitions of war; its wharves also may be used by the government free of charge and it must transmit official despatches over its telegraph and telephone lines without remuneration. The company agreed to invest not less than £50,000 in Costa Rica, and the investment is transferable to any persons or companies with the exception of foreign governments and their representatives. The fifty years' contract began on the day of its approval by the Congress, but provision was made that it should lapse should the company not begin operations within the six months following, or having begun should suspend the work for three consecutive years, or should the percentage tax fail of payment by the company. A \$10,000 (Costa Rican currency) guarantee of good faith was given to the government by the company.

Shipping and Communications.—In 1896 there entered Limón and Puntarenas 476 vessels of 421,125 tons, and cleared 475 of 473,929 tons. These vessels were chiefly British, German, and American (U. S.). The merchant marine in 1895 consisted of two steamers of 244 tons and 2 sailing vessels of 541 tons. There are two railways. One extends from Port Limón through San José to Alajuela, a distance of 117 miles; the other, 14 miles in length, connects Puntarenas with Esparta. A line uniting the latter town with Alajuela, thus completing rail communication between the two coasts, is under construction, and other roads have been projected. In 1897 the telegraph lines aggregated 878 miles with 43 offices; the post-offices numbered 81.

Government Steamship Contract.—In September 1898, it was announced that a contract had been formed between the government of Costa Rica and the Pacific Steam Navigation Company and the Compania Sud Americana de Vapores (South American Steamship Company). The contract provided that steamers of both companies plying between Valparaiso, Chile, and Ocos, Guatemala, should touch on both north and south bound trips, at least twice a month, at Puntarenas or at Tivives, as soon as the latter port should be opened; these steamers should afford facilities for handling passengers, mail and freight, and should carry without cost to the government Costa Rican mail matter which would naturally pass through the various destinations of the steamers, and they should also handle the Costa Rican mail from these ports. Immigrant laborers, artisans, etc., when under agreement with the government, should be carried by the companies at fifty per cent. of the regular rates, and government freight to or from Puntarenas or Tivives and between Panama and Ocos should be carried at a twenty-five per cent. reduction. Without authorization by the government the companies were not to carry troops or ammunition to any Costa Rican port, and the steamers were always to recognize such quarantine laws as might be established. In return for these considerations the government made the following concessions. The companies were to receive an annual subsidy of \$5,000 (Costa Rican money), which amount would be increased to \$7,500 in case the steamers should touch at Puntarenas or Tivives weekly. The steamers were exempted from all taxation except light house duty, which should not exceed an annual tax of \$100, and they should be subject to the existing marine laws of the government, excepting those suspended by the contract. The contract was to stand for two years and in case neither party announced three months previous to its expiration a desire to bring the contract to an end, it should stand for two years more. All differences which might arise between the government and the companies should be settled by arbitration.

The President's Message.—At the opening of the regular session of the National Congress May 1, 1898, President Yglesias transmitted a message briefly summing up the general condition of the fiscal year ending April 30. He congratulated the country on the successful termination of the recent troubles with Nicaragua, and expressed his gratification with the patriotism and spirit of unity which was manifest when war was imminent. The just criticism is frequently brought against Spanish speaking countries that the general population is in a state of lamentable ignorance; but with regard to education the President's report was encouraging. Among the statistics that he gave we would note that in 1893 there were 280 schools, but in 1898 there were 388, while the attendance in 1893 averaged 17,517, but in 1898 it averaged 23,134. In the former year there were 167 school buildings, in the latter there were 259, while 31 were being constructed and 78 more had been planned; during this time, moreover, the number of teachers had been increased by 332. School property, provided both by private subscription and by governmental appropriations, was valued at considerably more than \$1,000,000. President Yglesias also briefly reported the satisfactory condition of the treasury. During the fiscal year 1897-98, he said the public revenues aggregated \$8,424,104, an amount which exceeded the estimates by \$320,172 and the revenues of the previous year by \$936,935; the expenditures left a surplus of \$108,650. The government firmly believed in the gold standard and had a gold deposit of \$1,000,000, while the credit of the country both at home and abroad was good. The President reported that the Pacific Railway was the most important of the public works under construction. He said that the 1,000 to 1,200 men at work upon it were rapidly building the road, the first fifteen miles of which were at that time ready for the rails, and that he expected the road would be put in operation in 1899 between Limón on the Atlantic and Tivives on the Pacific coast. Among the other public works that were in process of construction were the National School of Correction, several wagon roads, and various sanitary improvements at Port Limón together with harbor improvements. See the article CENTRAL AMERICA.

COTTON AND THE COTTON INDUSTRY.* The commercial crop of cotton for the season of 1897-98 (ending Aug. 31, 1898), was 11,215,953 bales, averaging 507 pounds (gross weight) per bale, against a crop of 8,705,802 bales, averaging 502 pounds per bale (gross weight) for the previous season. The average price of Middling Upland Cotton in New York for the season was about 6¼ cents per pound, being 1⅜ cents less than the previous season. Mr. Thomas Ellison, of Liverpool, estimates British consumption for the season ending September 30, as 3,380,000 bales (of 500 pounds net), being 156,000 bales more than the previous season, and continental consumption as 4,576,000 bales of 500 pounds net (exclusive of about 250,000 bales of Asiatic cotton spun in Russia), being 208,000 bales more than the previous season. United States consumption for season ending August 31, is estimated as

*Summarized from *Cotton Facts* by A. B. Shepperson. Edition Dec., 1898.

2,922,000 bales (of 500 pounds net), being 205,000 bales more than last season. The Northern mills consumed about the same quantity as during the previous season, while the Southern mills consumed about 205,000 bales more. The "takings" (orders placed) of the American spinners from the crop were 3,465,000 (running) bales, exclusive of 114,000 bales sent to Canada; but the stocks of cotton held by the Northern mills at the end of the season were probably 375,000 bales more than at its commencement, and by Southern mills 37,000 more, making a total increase in United States mill stocks of 412,000 bales. This does not include 63,357 bales of Egyptian and 20,608 bales of Peruvian cotton imported during the season. The Peruvian cotton has been used, as heretofore, entirely in the manufacture of adulterated wool goods. In our exports of cotton during the season were 36,429 bales to Mexico, 211,104 bales to Japan, 13,562 bales to China, and 300 bales to India. The exports of the previous season to Mexico were 30,290 bales, and to Japan 61,456 bales. The takings of cotton for the season by the spinners of the United States were 673,000 bales more than in 1896-97; 960,000 bales more than in 1895-96; 594,000 bales more than in 1894-95; 1,174,000 bales more than in 1893-94. European spinners have taken 638,000 bales more than in 1896-97; 1,011,000 bales more than in 1895-96; 623,000 bales more than in 1894-95; 849,000 bales more than in 1893-94. European as well as American spinners have not only bought more, but have consumed more cotton than in any previous season. The cotton mills of India consumed, during the year ending June 30, 1,481,000 bales (of 392 pounds), being 180,000 bales more than the previous year. The cotton consuming countries of the world, from which reliable statistics are obtainable, have consumed 710,000 bales (of 500 pounds net) more than during the previous season—Europe showing an increase of 364,000 bales; the United States an increase of 205,000 bales, and India an increase of 141,000 bales. The stocks of cotton in the British mills on September 30, are estimated by Mr. Thomas Ellison of Liverpool as 108,000 bales (of 500 pounds net), being 77,000 bales more than on September 30, 1897, and at the Continental mills 493,000 bales, being 310,000 bales more than on the same date in 1897. The number of spindles in operation in Great Britain is estimated as the same as the previous season, while there was an increase of 1,030,000 spindles on the continent and 300,000 in the United States, the increase in this country being in the Southern States. While the consumption of cotton in the Northern mills was practically the same as the previous season, the consumption of the Southern mills increased nearly 22 per cent. Cotton goods have never been so low in this country. The chief cause of the low prices was the weight upon the markets of the immense accumulation of stocks of nearly every description of domestic cotton goods. The large stocks were due to the fact that the capacity of our cotton mills has increased so much faster than our population that the home demand is not equal to the production, and that we have practically no foreign outlet for our surplus of goods and yarns. During the year ending June 30, we exported 270,507,818 yards of cotton goods against 313,533,044 yards for previous fiscal year, a falling off in quantity of 14 per cent. The value of our exports of cotton manufactures of all kinds for year ending June 30 was \$17,024,092 (including \$23,878 to Cuba, \$3,884 to Porto Rico, \$361,379 to Hawaii, and \$1,304 to the Philippines), against \$21,037,678 the previous year, showing a falling off of 20 per cent. Great Britain's exports of cotton goods and yarns for year ending August 31 were equal to 6,313,140,500 yards of goods, valued at \$272,186,030. Though we furnish about 80 per cent. of the cotton used by the cotton mills of the world, the quantity of our exports of cotton manufactures is only $4\frac{1}{3}$ per cent. of those of Great Britain. The effect of our high tariff is to deprive us of export trade in cotton manufactures except for a limited quantity of goods, chiefly those in which the cotton itself contributes the largest proportion of the cost. The duty on machinery makes it cost fifty per cent. more than for a similar mill in England, thus requiring a larger capitalization and greater profits in order to pay dividends on the larger capital. Our mills are thus handicapped at the outset, but the duties on chemicals, acids, dyes, and everything which enters into the manufacture of bleached, colored or printed goods prevent our competing successfully with England even for the trade of such nearby countries as Mexico, the West Indies, Central and South America. If the tariff bars were let down so that the cost of the machinery to equip our mills and the cost of all the foreign articles needed for the various processes of manufacture should be no greater than in England, then our Northern and Southern mills alike would be able to build up a large foreign trade. There would then be no over-production with the inevitable result of reductions in the prices of goods and the wages of operatives, and our cotton manufacturing industry would increase and prosper as never before.

The following table prepared by Mr. A. B. Shepperson is a statement of the United States cotton crop and exports, and the annual takings (orders placed), of United States spinners from 1880 to August 31, 1898. This table gives the total commercial crop destination of export, amount of takings of Northern and Southern mills and the percentage of the American crop taken by American mills:

Statement of United States cotton crops and exports, and the annual takings (orders placed) of United States spinners since 1880 (in thousands of bales).

SEASON.	Total Commercial Crop.	EXPORTS. Exclusive of Railroad Shipments to Canada.			TAKEN FOR HOME CONSUMPTION. (Canadian Mills not included.)		Percentage of Crop Taken by U. S. Mills.
		To Great Britain.	To Contin't and Mexico.	Total Exports.	Takings of North'n Mills.	Takings of South'n Mills.	
1890-91.....	4,008	2,832	1,738	4,569	1,713	285	30
1891-92.....	5,458	2,255	1,254	3,551	1,677	247	30
1892-93.....	6,960	2,668	1,988	4,794	1,759	313	30
1893-94.....	6,718	2,485	1,488	3,917	1,537	340	30
1894-95.....	6,704	2,425	1,495	3,920	1,457	316	31
1895-96.....	6,575	2,385	1,771	4,238	1,781	351	32
1896-97.....	6,499	2,704	1,741	4,445	1,697	401	32
1897-98.....	7,047	2,414	1,813	4,287	1,905	454	32
1898-99.....	6,069	2,810	1,936	4,736	1,790	480	33
1899-00.....	7,297	2,654	2,052	4,906	1,730	545	33
1900-01.....	6,574	2,345	2,446	5,791	2,087	612	30
1901-02.....	9,018	3,817	2,541	5,858	2,172	694	30
1902-03.....	9,064	3,301	2,060	4,390	1,558	732	30
1903-04.....	7,532	2,801	2,371	5,228	1,530	711	30
1904-05.....	9,037	3,449	2,277	6,726	2,019	658	30
1905-06.....	7,147	2,998	2,288	4,637	1,805	600	30
1906-07.....	8,708	3,023	2,957	5,979	1,798	699	32
1907-08.....	11,218	2,544	3,998	7,540	2,211	1,254	31

The following table gives the number of acres planted in the States mentioned as estimated by the United States Department of Agriculture. The columns headed "percentage as compared with," etc., are given to show the percentage increase or decrease, in acres planted:

Acreage in cotton of the United States, as estimated by the United States Department of Agriculture. (A. B. Shepperson.)

STATE.	SEASON OF 1895-96.		SEASON OF 1896-97.		SEASON OF 1897-98.	
	Percentage Compared with 1894-95.	Number in Acres.	Percentage Compared with 1895-96.	Number of Acres.	Percentage Compared with 1896-97.	Number of Acres.
North Carolina.....	81	1,050,183	117	1,229,714	108	1,302,437
South Carolina.....	84	1,614,729	111	2,014,346	108	2,074,778
Georgia.....	85	3,069,322	112	3,468,384	102	3,537,701
Florida.....	95	191,540	188	364,325	95	251,109
Alabama.....	89	2,371,726	112	2,668,389	108	2,709,400
Mississippi.....	88	2,487,119	114	2,836,316	98	2,778,610
Louisiana.....	87	1,142,568	109	1,245,400	100	1,245,400
Texas.....	85	5,826,428	116	6,759,056	105	7,164,175
Arkansas.....	80	1,186,655	120	1,422,652	102	1,619,785
Tennessee.....	81	712,763	129	912,337	100	907,077
Indian Territory.....	91	212,847	161	342,684	100	459,197
Missouri.....	75	47,772	163	77,888	100	63,319
Virginia.....	73	44,823	107	47,747	100	50,612
Kentucky.....	..	6,133	.....	.....	.....	.....
Kansas, etc.....	..	136	.....	.....	.....	.....
Oklahoma.....	90	26,003	104	50,680	100	73,900
Total.....	85.2	20,190,875	110.3	24,445,394	102.5	24,319,500

For example the first percentage under season 1895-96 for North Carolina means that only 81 per cent. as much land was under cotton cultivation in 1895-96 as in the previous season.

The cotton acreage for India for the season ending June 30, of the years mentioned is given by Messrs. Lyons & Co., of Bombay, as follows:

Cotton acreage of India (in thousands of acres). (A. B. Shepperson.)

PRESIDENCY OR PROVINCE.	1896.	1897.	1898.	1899.
Bombay and Scinde.....	4,622	5,158	5,415	5,407
Punjab.....	1,128	1,177	1,161	1,125
N. West Provinces and Oudh.....	1,140	1,424	1,813	1,402
Bengal.....	177	157	198	204
Rajputana.....	543	549	515	619
Central India.....	841	423	404	512
Berars.....	2,150	2,307	2,072	2,108
Central Provinces.....	652	718	541	612
Hyderabad (Nizam's).....	*2,504	2,308	2,483	2,256
Madras.....	*1,672	*1,585	1,873	1,771
Mysore.....		50	55	*55
Assam.....		35	35	*35
Burmah—Lower.....	*260	10	10	*10
Burmah—Upper.....		180	185	*185
Ajmere and Meywara.....	*35	*35	35	*35
Total	15,214	16,066	16,245	16,862

Except where indicated by * the figures are from Government Reports.

The shipment of cotton to Europe from all Indian export ports for the years ending June 30, is given in the following table based on reports of Messrs. Lyon & Co., Bombay:

Shipments of cotton to Europe from all Indian ports for seasons ending June 30 (in thousands of bales). (A. B. Shepperson.)

FROM	1895-96.			1896-97.			1897-98.		
	To Great Britain.	To Continent.	Total Shipments.	To Great Britain.	To Continent.	Total Shipments.	To Great Britain.	To Continent.	Total Shipments.
Bombay.....	72	728	800	82	571	653	12	411	423
Kurrachee.....	5	99	104	7	126	133	3	121	124
Calcutta.....	9	94	103	8	81	89	4	25	29
Madras.....	19	19	38	8	23	31	3	10	13
Tuticorin.....	22	17	39	15	5	20	7	5	12
Coconada, etc.	6	13	19	9	14	23	6	8	14
Total	133	970	1,103	79	820	899	35	560	625

The cotton acreage of Egypt from 1890 to 1898 has been as follows: In 1890-91, 888,000 acres; in 1891-92, 863,000 acres; in 1892-93, 950,000 acres; in 1893-94, 1,050,000 acres; in 1895-96, 1,250,000 acres; in 1896-97, 1,300,000 acres; in 1897-98, 1,350,000 acres. In 1898-99, 1,450,000 acres were reported.

The total cotton shipments in thousands of bales, from Alexandria, Egypt, for the seasons of 1895-96, 1896-97 and 1897-98, and the shipments to Great Britain and the continent for the same periods, are given in the accompanying table:

Egyptian crop. Shipments from Alexandria (in thousands of bales). (A. B. Shepperson.)

Season of 1895-96.

To Great Britain (including 59,339 for United States and 5,359 to Bombay and Japan	405
To the continent	279

Total shipments 684

Season of 1896-97.

To Great Britain (including 51,056 for United States; 2,612 to India and 1,374 to Japan).....	397
To the continent	354

Total shipments 751

Season of 1897-98.

To Great Britain (including 54,979 for United States; 6,089 to Bombay and Japan)	411
To the continent	432
Total shipments	843

The crop of "rough Peruvian" cotton varies from 25,000 to 50,000 bales, and the greater part of it goes first to Great Britain. It is put up in bales of about 175 pounds.

The annual importations of Peruvian cotton into the United States have been as follows:

1887-88	4,279 bales
1888-89	7,650 bales
1889-90	9,500 bales
1890-91	10,515 bales
1891-92	13,000 bales
1892-93	24,000 bales
1893-94	19,000 bales
1894-95	24,000 bales
1895-96	24,603 bales
1896-97	16,604 bales
1897-98	20,608 bales

During the periods named in the following table (1897 and 1898) cotton goods of domestic manufacture have been shipped as indicated:

Quantities and values of annual exports from the United States of cotton goods of domestic manufacture, by countries, 1897 and 1898. (Compiled from reports of U. S. Treasury Department). (A. B. Shepperson.)

COUNTRIES TO WHICH EXPORTED.	YEAR ENDING JUNE 30, 1897.			YEAR ENDING JUNE 30, 1898.		
	Cloths—Colored and Uncolored.		All Other Cotton Manufactures.	Cloths—Colored and Uncolored.		All Other Cotton Manufactures.
	Quantity.	Value.	Value.	Quantity.	Value.	Value.
	(Yards.)	(Dollars.)	(Dollars.)	(Yards.)	(Dollars.)	(Dollars.)
Germany.....	1,538,890	95,672	219,760	487,397	43,096	190,041
Great Britain.....	11,094,345	890,421	467,656	10,765,945	728,234	380,049
All other Europe.....	1,350,949	55,680	62,300	1,545,821	100,755	73,785
Dominion of Canada.....	29,254,584	1,758,977	1,307,100	14,116,228	788,985	1,681,645
Central American States.....	10,446,766	538,962	222,266	8,408,741	390,510	214,244
Mexico.....	5,577,806	306,753	346,180	6,679,420	416,910	334,663
West Indies.....	15,803,544	919,602	161,706	16,402,051	a 627,711	a 128,784
Brazil.....	8,831,326	607,019	67,975	8,696,686	565,921	50,755
Chile.....	13,419,230	646,271	7,732	12,251,986	516,186	5,363
Other South America.....	22,877,755	1,372,022	170,628	20,280,451	1,084,357	109,537
China.....	140,121,035	7,488,208	22,775	115,492,797	5,185,845	7,582
Other Asia and Oceania.....	30,113,401	1,781,828	557,188	41,667,263	b 1,930,540	b 495,623
Madagascar.....	10,831,400	472,580	.....	5,500,474	226,159	.....
Other Africa.....	5,452,910	275,678	70,232	8,045,200	348,200	52,739
All other countries.....	1,419,290	87,020	73,363	100,641	5,206	7,212
Total.....	812,588,044	17,281,680	3,755,058	270,507,518	13,390,622	3,733,909

a Includes \$12,168 of cloths and \$11,715 of other manufactures to Cuba, and \$2,206 of cloths and \$1,678 of other manufactures to Porto Rico.

b Includes \$104,575 of cloths and \$256,604 of other manufactures to Hawaii; and \$1,304 of cloths to the Philippines.

For the fiscal year 1897 the total value of all exports of cotton goods of domestic manufacture amounted to \$21,037,678, while for 1898 the exports amounted to \$17,024,092. The exports of cotton goods and cotton yarns from Great Britain during the year ending Aug. 31, 1898, were according to the official reports of the British Board of Trade as follows:

Exports of cotton goods and cotton yarns from Great Britain during year ending August 13, 1898. (Compiled from official reports of British Board of Trade.) A. B. Shepperson.)

COUNTRIES TO WHICH EXPORTED.	GOODS (Yards).	Value of Cotton Goods exported during the year. £24,088,046 (equal to \$25,864,588).	YARNS (Pounds).	Value of Cotton Yarns exported during the year. £2,032,166 (equal to \$4,221,097).
Sweden, Norway and Russia.....	58,641,600		11,786,500	
Germany.....	66,728,100		40,385,700	
Denmark.....	55,850,500		7,165,000	
Holland.....	14,500,000		26,664,300	
Belgium.....	31,098,900		7,879,900	
France.....	18,069,700		4,762,900	
Portugal, Azores and Madeira.....	38,386,300		6,218,900	
Italy and Austria.....	418,461,400		84,900,100	
Greece.....	180,837,400		6,678,900	
Turkey.....	204,772,900			
Egypt.....	30,469,000			
Africa.....	149,680,800			
Peru.....	17,849,000			
Dutch Colonies in India.....	464,841,400			
Philippines.....	118,844,700			
China.....	48,580,000			
Japan.....	31,355,000			
United States.....	73,254,600			
British North America.....	41,328,100			
West Indies.....	580,682,000			
Mexico.....	2,167,988,900			
Central and South America.....	157,845,400			
British East Indies.....	189,598,000			
Australasia.....				
Other countries.....				
Total.....	5,028,008,500		267,086,800	

* Including small quantities to some of above named countries.

Cotton Manufacture in Japan and China.—In discussing this subject Mr. A. B. Shepperson says: While cotton is universally used by the Japanese for clothing, and has been spun and woven by them on hand-machines for centuries, the factory system of spinning and weaving with machinery driven by steam and water power was not adopted to any considerable extent until 1889, when about 200,000 spindles were in operation.

Since then the progress of the industry has been so rapid that it is thought two-thirds of the Japanese spindles now at work can supply all the yarn needed for home consumption, while the product of one-third of the spindles is seeking foreign markets in the East (notably in China), in sharp competition with England and India. Reliable advices state that on Aug. 1, 1898, there were in operation in Japan 76 mills with 1,086,082 spindles and 2,900 looms, while 3 mills and 223,954 spindles were being erected.

The official *Résumé Statistique de L'Empire du Japon*, published at Tokio in 1897, gives the following statistics of cotton mills for 1890 to 1895:

Year ending Dec. 31.	Number of Spindles.	Cotton Consum- ed (Sales of 500 lbs. net).	Yarn Produced (Pounds).	Number of Operatives. (Males.)	Number of Operatives. (Females.)	Average Daily Wages of Males. (Sen.)	Average Daily Wages of Females. (Sen.)
1890.....	377,886	99,375	42,771,568	4,089	10,880	17.	9.2
1891.....	358,980	149,621	64,082,817	5,061	14,318	17.7	9.
1892.....	366,214	304,018	81,084,815	6,264	18,678	17.4	9.6
1893.....	381,781	192,186	89,667,286	6,164	19,284	17.4	9.4
1894.....	580,074	288,221	121,868,400	6,129	20,289	17.1	9.9
1895.....	580,945	362,666	153,426,788	9,660	31,140	18.	9.9

The consumption of 1897 was 42 per cent. greater than in 1895.

In May, 1898, the average daily wages paid by the mills were 24.71 sen (equal to about 12.35 cents United States money) for male and 14.71 sen (or about 7.35 cents) for female operatives, being an advance of about 37 per cent. for males and 50 per cent. for females since 1895.

The consumption of cotton by the mills during year ending December 31, 1897, was as follows:

East Indian cotton....	161,680,866	pounds; equal to	323,362	bales of 500 lbs net
Chinese cotton	45,089,800	"	90,179	"
American cotton	43,162,192	"	86,324	"
Anam and Saigon cotton	5,881,817	"	11,764	"
Egyptian cotton	1,411,058	"	2,822	"
Japanese cotton	1,068,383	"	2,137	"
Other kinds of cotton..	117,158	"	234	"
Total consumption...			516,822	

The Japanese sen is worth one cent in silver and at the present value of silver is equal to about one-half of a cent in United States money. The mills run 22 hours each day, and there are two sets of operatives—one for day and the other for night work—each set of operatives working 11 hours per day.

The largely increased purchases of American cotton by the Japanese of recent years is an indication that their mills are making a larger proportion of higher grades of yarn than formerly. It also shows that they are quick to appreciate the fact that, at the low prices of the past year, American cotton is really the best and cheapest in the world for the great majority of spinners to use.

Since 1893 the annual exports of cotton from the United States to Japan for years ending August 31, have been as follows:

1893-94	6,668	bales
1894-95	18,750	bales
1895-96	39,211	bales
1896-97	61,456	bales
1897-98	211,104	bales

The present production of cotton in China is probably equivalent to about 1,300,000 bales of 500 pounds net. The cotton which is not retained in the interior to be spun there is usually shipped "unginned" (or just as it is picked from the plants) to the ports, where it is ginned and packed into bales of about 500 pounds. During year ending August 31 last, 13,562 bales of American cotton were shipped from United States to Chinese mills, doubtless for mixing with Chinese cotton.

COULDOCK, CHARLES WALTER, actor, died in New York November 27, 1898. He was born in London, England, in 1815; went on the stage at the age of twenty-one and his early experiences were attended with much hardship. He gained a place in his profession, however, and played with many stars, including Kean, Macready, Buckstone, Charles Matthews, Charlotte Cushman and Mme. Vestris. His first appearance in America was in New York, in 1849; afterwards he played with Mr. Joseph Jefferson and the late E. A. Sothern. Among his rôles may be mentioned "Jacques," "Cardinal Wolsey," "King Lear," "Othello," and "Macbeth," but his rôle best known to younger Americans was that of the old miller in *Hazel Kirk*. He appeared in this character 1,500 times, the first time being in 1879 and the last at the Star theatre, New York, in September 1898.

COUNCIL OF JEWISH WOMEN, organized in 1893 for the study of Jewish history, religion, and literature, has 4,500 members. Its headquarters are Chicago. President, Hannah P. Solomon; secretary, Sadie American, 3,130 Vernon avenue, Chicago, Ill.

CRAMER, Rev. MICHAEL JOHN, D. D., educator and diplomat, died at Carlisle, Pennsylvania, January 23, 1898. He was born at Schaffhausen, Switzerland, in 1835, was graduated at the Ohio Wesleyan University 1860, and having entered the Methodist ministry, was a chaplain in the United States army 1864-67. He married in 1863 Mary F., sister to Gen. U. S. Grant. Under President Johnson he was Consul at Leipsic; President Grant appointed him Minister to Denmark, and under President Garfield he was *Chargé d'Affaires* to Switzerland. He was professor of systematic theology at Boston University 1885-87; he wrote for theological periodicals and in 1889 became associate editor of the *Theological Quarterly Review*; for a year he was professor of church history at Drew Seminary, Madison, New Jersey, and late in 1897 was elected to the chair of philosophy at Dickinson College, Carlisle, Pennsylvania.

CREMATION OF THE DEAD. This means of disposing of the dead is slowly increasing in favor in Europe and America. Crematories are reported in the United States at Boston, Buffalo, Fresh Pond, N. Y., Lancaster, Philadelphia, Detroit, Davenport, St. Louis and Los Angeles. The crematory at Fresh Pond is

owned by the United States Cremation Company, of New York City. From December 4, 1885, to the close of 1889, 2,900 bodies were burned at Fresh Pond. The birthplaces of the decedents were as follows: Germany, 1,492; United States, 984; England, 94; Switzerland, 66; Austria, 54; France, 45; Ireland, 22; scattering, 133. The division by sex is: Males, 2,065; females, 935. The Cremation Society of England, started in 1874, had burned over 1,000 bodies at Woking up to the end of 1897, the number in 1897 being 173, as compared with 137 in 1896. Crematories owned by municipalities are unknown in the United States, but are reported as in existence at Rome, Milan, Florence, Venice, Leghorn, Rouen, and Gotha, while at Prague, Bohemia, there is one owned by the general government.

CREMATION OF GARBAGE. See GARBAGE.

CRESPO, JOAQUIN, ex-President of Venezuela and General-in-Chief of the army, was killed in an engagement with insurgents April 17, 1898. He was of mixed Spanish and Indian blood and was born at San Francisco, Miranda, August 22, 1841. In early life he joined the Federalist party and took part in the various internal disturbances of his country. He first came into prominence as a soldier in 1871, when he won the battle of Cano Amarillo, thus turning the tide of victory in favor of the revolutionists. In 1879 Crespo brought Guzman Blanco's revolution to a successful termination at the battle of El Zamuro, and he became governor of the state of Guarico, and in 1884-86 was president of the republic. Blanco succeeded him and in 1888 turned the office over to Dr. Rojas Paul, whereupon Crespo attempted to bring about a revolution, but was unsuccessful and fled to Peru, going in 1889 to Washington, D. C. When in 1892 President R. Andueza Palacio proclaimed himself dictator, Crespo raised an army, defeated Palacio on October 10, and proclaimed himself provisional President. About two weeks later this government was recognized by the American minister and Crespo became President; under him the government was reorganized. He was reelected in 1894; he was succeeded by his friend, General Ignacio Andrade, who was elected in September 1897, defeating Rojas Paul and General Hernandez. Crespo became governor of the state of Miranda. A rebellion was headed by Hernandez and it was in overcoming this that Crespo was killed. General Crespo was a man of intelligence and ability, "rather above the usual type of South American revolutionists," and his loss was keenly felt by his government. See VENEZUELA.

CRETE, one of the largest islands of the Mediterranean, lying to the south of the Egean Sea at the entrance of the archipelago, with a population, according to estimates based on the census of 1885, of 294,192, but later estimates place it at 370,000, comprising about 300,000 Christians and 70,000 Moslems. The principal cities are Candia (pop. 25,000), Canea, or Khandia (pop. 15,000), and Retimo (pop. 9,000).

The Political Situation.—The administration of government in Crete in 1897 was a crying question and during 1898 continued to present many perplexing difficulties. Just before the outbreak of the Græco-Turkish war the powers were about to establish an autonomous government in Crete under the nominal sovereignty of the Sultan. They promised that the Turkish troops should evacuate the island and that the Porte should not interfere in the administration of Cretan internal affairs. When the war was ended, Turkey having been overwhelmingly victorious, the attitude of the powers changed. The autonomous government was not put into operation; the fifteen thousand Turkish regulars did not withdraw, nor did the thousands of bashi-bazouks, those cruel Moslem desperadoes, who, while receiving no pay, get their sustenance from the government, and for whose acts the Porte denies its responsibility; and Djevad Pasha, who immediately began intrigues, was appointed Military Governor. Murder and outrage, committed largely by the bashi-bazouks, continued. The powers still had land and naval forces in the island, and in September 1897, the Porte requested that these withdraw, and almost at the same time the revolutionary government asked that the Turkish forces leave, repeating its willingness to accept the previously proposed plan of autonomy. The forces of the powers remained, but no satisfactory answer was given to the Cretan Christians. The European ambassadors at Constantinople, under the advice of the admirals, were occupied at this time in attempting to fix upon a governor for Crete who would be fair in the administration of government and still be acceptable to the Sultan. Various names were suggested only to be rejected; among them were Franz Joseph, of Battenberg; Colonel Schaeffer of Luxembourg; M. Numa Droze, ex-President of the Swiss Republic; and M. Petrovich, a relative of the Prince of Montenegro. Government in the meantime was being administered as well as possible by the foreign admirals, but on account of the attitude of the Porte their position was precarious, and plundering, looting, and even murder was continued by the bashi-bazouks. It is said that the condition of the native Christians in the interior of the island was pitiful during the winter of '97-98. In the early part of the year Prince George, of Greece, was proposed for Military Governor. His cause was advocated most zealously by the Czar and

protested against with equal vigor by the Sultan. In the first week in February it was announced that the governorship and the Cretan question generally had been postponed for the time, and a few days later it was learned that even Russia had abandoned the candidacy of Prince George, but would not allow an increase in the number of Turkish troops in Crete, or be a party to any coercion of the Cretans. The attention of the powers was now taken from Cretan affairs by reason of the international complications in the Far East and the impending war between the United States and Spain. Germany and Austria withdrew their forces from the island, leaving matters in charge of the British, Russian, French, and Italian admirals. Fearing further outbreaks, they began reform measures, endeavoring to institute temporary laws. They retained seaports for their own administration, but gave the interior over to the control of the Christians, directing that six administrators be elected by the Cretan Assembly. This was not autonomy, but the Cretans, grateful for any relief, accepted unconditionally the new form of government, July 25, 1898. The administrators submitted a new set of laws to the admirals, who approved them, and the new administration began; but as soon as a Christian was given a position in the Custom House, the Turks became enraged.

Violent Outbreaks.—The bitterness increased until September 6, when it culminated in Candia in a Moslem attack on the Christians and on the British troops; on that day a crowd of unarmed Moslems tried to force their way into the revenue office, and in repelling them the British troops found it necessary to open fire. The Turks dispersed, but only to get their arms, and returning they attacked the British soldiers, killing seventeen and wounding fifty, and then began generally to loot and pillage and to murder the Christians. About seven hundred Christians were massacred, the British, German, and Spanish Consulates were plundered and wrecked, and the British Consul was burned to death in his own house. A bombardment of the city by the British and other warships in the harbor ensued, and considerable damage was done. Edhem Pasha, who was then the Turkish Governor, claimed that he was unable to quell the outbreak, but it was thought that he himself was responsible for it and connived at it, having had, it was said, warning that the massacre was being planned. Furthermore some of the Turkish regular troops took part in the affair. The British admiral had made two demands of the Porte: the one that Edhem Pasha turn over to him the leaders of the insurrection; the other that the bashi-bazouks be disarmed. The first demand was easily complied with, Edhem Pasha surrendering about forty men to the admiral. It was thought, however, that these were not the real leaders at all, but were more probably criminals whom the wily Turk palmed off in this way. The second demand greatly disturbed the Sultan and Turkish officials both in Constantinople and in Crete. Edhem Pasha begged the admiral for more time, and the Sultan sent imploring messages to the various ambassadors urging their support against the demand. The situation became worse and fighting was resumed; the Christians gathered around Candia waiting for opportunities to avenge themselves on the Turks. Admiral Noel remained firm, setting a time for a second bombardment if the Turkish government would not disarm the bashi-bazouks. Finally the Sultan telegraphed that the ultimatum would be complied with.

The Withdrawal of the Turkish Troops.—The situation was still very grave, for the new Cretan government realized its inability to maintain peace and order while a Turkish army with its intriguing leaders remained in the island. It was suggested that an ultimatum from the powers force the Sultan to withdraw his troops, and that British and Italian garrisons be substituted.

Prince George Chosen Governor.—In November 1898, the four powers were maintaining on the island about 16,000 troops, about one-half of whom were British, and were trying to carry out their agreement to protect the Mussulmans. Nevertheless many of the latter were leaving the island. On November 26, it was announced that Prince George of Greece was to be the High Commissioner in Crete for the four powers, the latter having agreed upon his nomination. He assumed the duties of his office on December 21. While acknowledging the suzerainty of the Sultan, he was to organize an autonomous government in coöperation with the general assembly, guaranteeing freedom of religion, and security of life and property, and establishing a gendarmerie. To aid in defraying expenses of administration, each of the four protecting powers agreed to advance the sum of \$200,000, which should afterwards be repaid by the Cretan government.

CRIME. The objects of a statistical investigation of crime are perhaps too obvious to need explanation. Their immediate purpose is of course to ascertain the effect of criminal legislation. As Lord Brougham said in 1860, "Criminal statistics are for the legislator what the chart and the compass are for the navigator." Secondly, an even more important object of this study is to ascertain the real nature of the social phenomenon called crime, its extent, its increase or decrease, and the influences which determine it. There are seri-

ous obstacles in the way of such investigations, especially when they aim to compare the extent of the criminality of one country with that of another. The chief of these obstacles is the difference between the laws in the different countries together with the differing degrees of administrative efficiency which give the criminal a greater or less chance of acquittal. Moreover the official methods of classification of crime vary, and crimes which appear under one name in one country are classified differently in another. Nevertheless these investigations have on the whole proved fruitful. Their aim is to show the influences of external physical conditions such as climate, geographical situation, nationality, seasons and months, or the influence of social and economic conditions, such as the scarcity of food, commercial crises, religious confession, etc., or the influence of subjective and biological conditions including the organic constitution of the criminal, his mental constitution and his personal characteristics. In the investigation of the last named influences very effective work has been done in recent years by such writers as Lombroso, Ferri, and Beltrani-Scalia. These writers and others of the so-called experimental or positive school, lay great stress on the anthropological factors of criminality, although they hold that crime is a product equally of physical and social conditions. They think it erroneous to argue that crime is nothing but a social phenomenon with which the abnormalities of the individual, whether physical or psychical, have nothing to do. Crime cannot be understood, they say, except by a study of all the factors entering into the production of the criminal type.

Regularity of Crime.—The most remarkable feature of criminal statistics is the proof which they afford of the regularity in the number of crimes. This regularity was first presented in its most striking form by the great Belgian statistician Quetelet, who said that there is a budget paid with greater regularity than that of any finance minister, namely, the budget of the prison, the galleys and the scaffold. Later investigations have borne out this general statement, although they show considerable fluctuation in the number of crimes. This regularity is far more conspicuous in the case of the more serious crimes than in that of the minor offenses. The Italian criminal sociologist, Professor Ferri, considers the most striking fact brought to light by statistical investigations to be the "steadiness of the gravest form of crime side by side with the continuous increase of slighter offenses." But while crime increases in the aggregate, there are oscillations from year to year. Professor Ferri has put forth an interesting theory which he calls the "Law of Criminal Saturation," by which he means that just as a certain quantity of chemical substance and not an atom more or less can be held in solution at a given temperature in a given volume of water, so there is always a fixed number of crimes in a given social environment under certain defined physical conditions of the individual. Statistics show that variations in the environments result in variations, more or less proportionate, in crime. Thus it has been observed that crimes against the person in France have varied but little during a period of sixty-two years, and where the variations have been at all marked they have been in years of political excitement or intense heat, or otherwise exceptional years; while on the other hand the crimes against property have fluctuated from year to year with economic conditions. Professor Ferri says that this regularity was so marked, that in tracing the movement of criminality he was able to guess at the existence of some crisis or other disturbing cause during the year. By statistics alone he could in a measure trace the history of the country. The effect of economic conditions is sometimes rather surprising. Thus in times of famine it was observed by Professor Ferri that a certain class of crimes increased while another class diminished. His investigation of the matter showed that slight offenses which were sufficient to land the offender in prison were resorted to in order to secure maintenance at the public expense, while other classes of crimes diminished contrary to our natural supposition, that a time of hardship and scarcity is accompanied by a general increase of violence of all kinds.

One of the conclusions which he draws from this law of criminal saturation is that the belief in a mechanical regularity in crimes is to some degree unfounded and he revises the statement of Quetelet's that the budget of crime is an annual taxation paid with more preciseness than any other, by an appeal to statistics, covering a longer period of time than those of Quetelet who limited his inquiry to the more serious crimes and to a comparatively short succession of years. Another consequence of his so-called law is that penalties which have hitherto been regarded as the best remedies for crime are not so effectual as they are thought to be, since crimes increase and diminish as the result of a great variety of other causes. Familiar instances of such a movement of crime quite apart from repressive legislation, are afforded by the history of the declining Roman Empire, especially as regards the severe penalties imposed for serious crimes and the attempt to crush out Christianity with punishments and tortures; and again by the history of Catholic Europe in its struggle to uproot Protestantism by persecution. The view, however, that the repression of

crime is not measured by the severity of punishment is so old and well established that it hardly needs corroboration.

Increase of Crime.—While an international comparison of criminality is impossible on account of the differences in the criminal law, administrative efficiency, and official classification in the different countries, some idea of the relative frequency of crimes in the principal civilized countries can be had by a study of recent statistics. In Great Britain and Ireland the figures for a long term of years seem to show that serious crime is on the decrease, not only relatively but absolutely. According to Professor Mayo-Smith, it sank from 522 per million inhabitants in 1871 to 332 in 1891. On the other hand misdemeanors greatly increased during the same period. In France where the criminal statistics extend as far back as 1825, it seems that serious crimes have also decreased, while slighter offenses have increased. The rate of crime against person and property during the decennial period from 1830 to 1839 was 228 and for the period between 1870 and 1879 was 127. In Germany, a comparison of the criminal statistics for 1882 with those for 1892 shows a great increase in crime against property, against the person and against the state.

This increase of crime as a whole becomes significant only when we consider the kinds of crime and the increase or decrease in each case. The most common division is into crimes against the person and crimes against property. Their proportion varies in different countries and according as we take all crimes or divide the serious from the less serious. At the present time, the greater proportion of crimes in the leading countries of the world are crimes against property. Statistics quoted by Professor Mayo-Smith showing the proportion of the different kinds of crime committed in the years 1879-80 and 1890-91, respectively, give 75 per cent. in the former year as crimes against property without violence, 13 per cent. against property with violence, 5.4 per cent. against the person, while for the latter year there were 67.3 per cent. crimes against property without violence, 16 per cent. with violence and 9 per cent. against persons. On the whole it appears that the misdemeanors or slighter offenses have greatly increased, while the proportionate number of serious offenses have slightly diminished or remained the same. Comparing police contraventions and offenses in France in the years 1826 and 1828 with those in the years 1885 and 1887, Professor Ferri finds that to every one hundred police contraventions in the former period there were 391 in the latter, and to every one hundred offenses in the former period there were 397 in the latter. At the same time crimes against the person fell off during the interval of these years at the ratio of 100 to 98, and crimes against property at the ratio of 100 to 41. In Belgium, England, Austria and Spain there was also a marked increase in the slighter offenses as compared with the more serious transgressions. In Germany and Prussia, however, the crimes against the person increased as much as, if not more than, the slighter offenses.

The Kinds of Crime.—There are some considerations which tend to weaken the obvious conclusions to be drawn from these figures. In the first place the increase of the slighter offenses is due in part to additions to the penal code. New offenses are created by law and the number of delinquents naturally become greater. Take, for instance, the great increase in slighter offenses shown by the prison statistics of Great Britain, published in 1898. The whole class of bicycle offenses has come into existence in recent years. Again, the returns upon which the statistics are based classify offenses according to the courts before which they are tried, and the apparent decrease of the more serious offenses as compared with the lighter is often due to the choice of prisoners to be sentenced by an inferior court rather than to undergo trial by jury. The effect of this is very marked when the investigations cover a long period of years, as for instance in France where there have been many new enactments resulting in the addition of new classes of offenders to the list. In England a great addition to the number of slight delinquents is due in part to the more stringent laws in regard to drunkenness. Another fact which must be borne in mind when we consider the increase of crime as a whole is the increase of population. Yet here when we consider only short intervals of time there is danger of attaching too much importance to this fact for the addition of infants and young children does not affect the number of people of the criminal age. France shows an unusually large proportion of crimes against the person; in 1890 46 per cent. of the crimes were of this character. For the same year in the United States the census showed that 21 per cent. of the crimes committed were against the person, 45.8 per cent. against property, and 22.9 per cent. against society. As to the most common forms of particular crimes, it would appear that in England more than one-half of the indictable offenses were larcenies. In France larceny was also the principal crime, but it did not bear in 1887 any such proportion as this, the larcenies numbering 1,439 out of 4,307 serious crimes tried before juries. In the United States, according to the census of 1890,

the principal crimes were larceny, burglary, assault, homicide, and disorderly conduct.

Geographical Position and Climate.—The influence of geographical position and climate has been studied with some striking results, although the matter has not as yet been thoroughly worked out. Early in the present century a study of criminal statistics seemed to bring to light the remarkable difference between the character of the crimes committed in southern, middle and northern France. In the northern and southern zone the crimes against the person and against property were in almost exactly inverse proportion; while in the northern zone the crimes against the person were in the proportion of 2.7 and those against the property 4.9, in the southern zone those against the person were 4.96 and those against property of 2.32. Later investigations have seemed to establish these conclusions in a general way. In Italy there seems to be a similar geographical distribution of crimes, those against the person being the most frequent in the south and those against property in the north. In Germany the eastern provinces show a greater propensity toward the more serious crimes than the western provinces, but this is attributable perhaps to the differing economic and social conditions in the two sections. As to the influence of the seasons, it is generally agreed that crimes against the person are more common in summer than in winter, while the reverse is true of crimes against property.

There is a marked distinction as would naturally be supposed between the criminality of cities and that of country districts. In France where the rural population is twice as numerous as the urban, 44 per cent. of the persons tried before juries in 1890 lived in towns of 2,000 inhabitants or over and only 43 per cent. lived in the country, the remaining 13 per cent. having no permanent residence. This matter is affected largely by the relative efficiency of the police. Thus in England some statistics seem to show a greater degree of criminality in the counties than in the large cities, owing to the superior police system of the latter.

Race.—The effect of race and social conditions on crime is hard to trace. In the United States there are statistics showing the relative number of criminals among the native born and the foreign born. In 1890, these attributed 57 per cent. to the foreign element. There were 882.45 native born white prisoners per million and 1,822.43 foreign born white prisoners per million. Taking the foreign born and those of foreign parentage together, there were 1,523.06 prisoners per million among them as against 753.7 per million of native whites of native parents. Here the fact that the foreign born element contains a far larger proportion of adults materially alters the conclusions which might otherwise be drawn from these figures. The foreign born made up 26.2 per cent. of the male prisoners, while the foreign born element in the male population eighteen years of age and over was 26.38 per cent. A greater proportion of foreign born prisoners, however, had been committed for offenses against society than was the case with either the native whites or the colored.

Religious Confession.—The relation of religious confession to criminality is a matter of importance, but it is difficult to obtain clear results. For Germany, the Protestant portions of the country are said to furnish fewer criminals in proportion to the population than the Roman Catholic portions. But this fact is obscured by the differences in racial temperament and by social and economic differences. Criminal statistics in regard to the Jews, however, show clearly that they have less criminality as a whole than the Christians, and yet in certain crimes to which they are more especially tempted on account of their inclination to mercantile life, they show a higher rate of criminality than the Christians. These crimes are such as forgery, fraudulent bankruptcy, perjury and slander.

Social Position and Education.—As to the effects of social position and education, they are as might be supposed quite manifest from the criminal statistics: the lower classes are more prone to crime than the higher and the illiterate than the well educated. Statistics of the relative criminality of certain occupations and professions show some interesting differences in Germany where this matter has been investigated. It was found that per 100,000 persons of criminal age condemned for crime, 1,480 were engaged in trade and commerce, 1,322.4 in industry, 717.3 in agriculture, 307.8 in domestic service, while those engaged in other or no occupation numbered 2,476 per 100,000. The table showed a greater disposition of persons engaged in industry to commit crimes against the person, than against property, while those engaged in trade and commerce committed a greater number of crimes against property and the latter fact was true also of those engaged in other or no occupation.

Sex, Age and Conjugal Condition.—As between male and females, by far the greater proportion of crimes are committed by males. In Germany for a period of five years, 1885-1890, it was found that the ratio was twenty-one females for every one hundred males. There is a difference between

the sexes in the kind of crimes which they are the more likely to commit. The women commit a greater proportionate number of crimes against property and a far smaller proportion against public order. The effect of age is of course very powerful, the criminal age being between 21-40. Yet a very large number of crimes against property are committed by persons between the ages of twelve and eighteen. This is the period during which the petty thieving is likely to be practised. As to the influence of conjugal condition on criminality it would seem that it acts as a deterrent. The majority of criminals are unmarried. Yet it is said by a German statistician that married women of the age of thirty or over are more likely to commit crimes than single women of the same age. Widowhood and divorce seem from the statistics to increase crime.

Penalties.—It is generally believed by criminologists that the severity of the penalty does not suffice for the repression of crime. In France, for instance, it cannot be said that the growth of crime has been accompanied by a relaxation of the punishment. It is a law accepted by most writers on this subject that what deters the criminal is the certainty rather than the severity of the punishment and the most important considerations on the subject of judicial repression of crime are (1) the ratio borne by the persons acquitted to the total number tried, and (2) the ratio of severe penalties to the total number condemned. The criminally inclined element in the population do not study the penal code and they understand the law only when it is applied. In case of a large proportion of acquittals, there is a tendency on their part to see in it the relaxation of judicial severity rather than a more careful weighing of the evidences of guilt. In countries, however, where the acquittals have shown no sign of increase and have even diminished, crime has continued to increase. This is especially true of France where the percentage of acquittals has steadily decreased and yet crime has increased to a great extent. In France, too, the other factor in judicial repression, namely, the ratio of severe penalties, has shown no signs of abatement. The severe punishments bear as large a proportion to the others as they did formerly. Substantially the same is true of Italy and England. Thus while repression measures have been growing stronger crime also has been on the increase. In England in 1891 out of 9,055 persons convicted of serious offenses, 7,548 were sentenced merely to imprisonment, the ordinary imprisonment being from one month to one year; 751 were sentenced to penal servitude, 678 were fined, etc., 59 were sent to reformatory schools, and 19 suffered the death penalty. In the case of the less serious crimes and misdemeanors about three-fourths were punished by fines. In 1896, 33 suffered the death penalty, 6 penal servitude for life, 754 penal servitude for a term of years, and 7,057 short periods of imprisonment.

Statistics for England and Wales published in 1897 and 1898 show a decrease of the number of persons committed to prison since the year 1880. Comparing that year with 1898 the number of persons committed on indictment decreased 19.6 per cent. and the number committed on summary conviction decreased 2 per cent. In 1898 there were 8,044 committed to prison on indictment and 145,961 committed on summary conviction. It must be remembered that the decrease of these committals has been accompanied by a considerable increase of the population. When this is taken into account the decrease for the committals on indictment is 30 per cent. and for committals on summary conviction 17 per cent. Another point which makes these figures encouraging is the increase in the number of offenses created by law during the period. There has been, furthermore, greater activity on the part of the police as well as greater administrative power in dealing with these offenses. At the same time offenses of a quasi-criminal kind have greatly increased during the same period. In 1885-6 the total number of convictions for these offenses was 229,285 as against 324,944 in 1896-7. This more than offsets the decrease of the committals to prison and when all convictions were counted up it was seen that they had increased from 519,781 in 1885-6 to 644,296 in 1896-7. At the same time it should be noted that this is partly due to the creation of new offenses. For example, bicycle offenses in 1895 under the Act of 1888 numbered 3,142. The returns show a diminution in the number of juvenile prisoners, that is, persons under sixteen. A new system has gone into operation whereby juveniles sentenced for minor offenses are placed in certain selected prisons. Efforts have been made to check their criminal career at the outset, and the work has been fairly successful. As to convicts, the average length of the sentence in 1898 was 6.86 years for males and 8.34 for females. In England a distinction has been made between the first offenders and other criminals. In 1897 the Prison Commissioners separated completely the first offenders in the local prisons from the habitual criminals. The result was successful, this class being of a much better stamp morally than the others and more susceptible to good influence. The formation of a so-called "star class" in 1879 whereby this principle was applied to convict prisons has had successful results. It was reported that out of 2,183 male convicts placed in this class between 1879 and 1896, only twenty of those discharged returned to penal servitude,

and of the 93 females none returned to penal servitude. There has recently been in England a tendency to substitute useful work for the mere unproductive disciplinary work of the prisons, and the earnings from this source have been considerable.

The failure of punishment to extirpate crime has led many writers to favor a resort to supplementary means. Special emphasis has been laid in recent years upon preventive measures. Practical experience has taught men that social and economic conditions have had a far greater influence on crime than any changes which have been made in the penal codes. For instance, the removal of restraints from emigration in certain countries has greatly reduced the number of criminals. The lowering of the import tariff has in some countries done more to suppress smuggling than the severity of the laws or the guns of the coast guards. Heavy and unjust taxation has been accompanied by economic frauds which in spite of the severest penalties have existed until the taxes were abolished or reduced. The connection between the consumption of alcohol and crime would seem to be too evident to need demonstration, yet some writers pointing to the fact that statistics of the alcohol consumption do not show a parallel movement with the statistics of crime have denied the existence of any necessary connection. The answer to their arguments is that we can not expect to find social statistics moving exactly parallel to statistics relating to a single cause. The fact that crime varies with other causes than drink does not prove that drink is not an important causal element. It is absurd to hold that what is injurious to the individual should not be injurious to a society composed of individuals. In many countries efforts have been made to uproot the evil of alcoholism but the results are not very marked. Indirect influences, such as the improvement of economic and intellectual conditions have probably had more effect than statutory enactments. Other instances of the prevention of crime through measures of improvement brought about by advancing civilization might be multiplied indefinitely. The importance of this aspect of the subject lies in its indication of the methods which should be adopted for the checking of crime. It is far more important to set social forces in motion and to erect barriers to crime than to rely on improvements in the penal code.

Proposed Reforms.—Some of the practical reforms suggested by recent writers have resulted from the perception that crime is a product of social, anthropological and physical factors. They believe that the object of punishment is not retribution and that its measure should not be the result of an estimate of the moral culpability of the condemned. The action against a criminal is regarded by them as a measure merely for the defense of society, and the punishment should be calculated with reference to its efficacy in removing the cause of danger. An arbitrary scale of penalties proportioned to the degrees of moral guilt appears to the modern criminal sociologist as wholly absurd.

It will be possible here to mention only a few of the practical reforms proposed. Some have been tried or have long existed in certain countries. Such for instance is the Scottish system of distinguishing by the verdict of "not proven" between fully demonstrative innocence and the doubtful cases in which guilt could not be legally established. Another reform proposed is the revision of judicial errors in the interest of the unjustly condemned and the indemnification by the state for an injury to a citizen resulting from this cause. It has been proposed that a sum should be set apart by the State to indemnify the victims of miscarriage of justice. The "Positive School" also advocates the elimination from the penal code of the slight contraventions which are constantly being added to the list, such for instance as acts committed by people through negligence or imprudence. These they say should be reckoned as merely civil offenses.

In regard to existing methods of securing information, conducting trials, and rendering a decision, later writers have offered many criticisms and suggestions. For one thing, in the collection of evidence it has been proposed that more attention should be paid to the anthropological factors of crime. Expert knowledge of criminals should be required of those who conduct inquiries. Police agents and examining magistrates should have the advice of experts in criminal anthropology in their work. For example the extension of systems like Bertillon's for the identification of criminals is desired. Again there are certain criteria for the credibility of witnesses which could be applied by men versed in psychology and neurology to far better advantage than by those merely learned in the intricacies of the law. If a judge requires experts in such cases as forgery, poisoning, etc., why, it is asked, is expert knowledge not needed equally in other cases? The credibility of a person's testimony can often be determined only by a knowledge of neurotic conditions. The tendency of hysterical persons to slander and of children to tell untruths would be cases in point. And a double importance attaches to this because the expert knowledge would not only answer the question of guilt or innocence with greater certainty but would classify the criminal and indicate what form of punishment was best suited to his case. For the later writers do not believe in fixed punishments. They would

have punishments adapted to each case with a view to crushing out the criminal instinct wherever possible. They would prescribe a punishment as a physician would prescribe a cure, except in cases of confirmed criminality, in which there was small chance of amendment. Criminal lunatic asylums are approved by many. A "rational system of punishment" was proposed by Garofalo, which for certain classes of murderers proposed the death penalty or criminal lunatic asylum, and for other offenses made a threefold division of, (1) persons of violent or impulsive characters, (2) dishonest criminals and (3) of persons guilty of outbreaks against authority, the punishment in these last three classes of cases being elastic and conditional. In general it is the idea of the later school that there should be no fixity in the periods of detention or segregation, that the defensive measures should be adapted to the various types of criminals, and that the system of damages or indemnification should be better worked out. On this last point it has been urged by some that the criminals should be compelled to pay damages to the injured party.

Many attempts have been made in recent years to prevent discharged prisoners from returning to their criminal career. There has always been a large proportion of recidivists, that is people who show persistent criminal tendencies and commit crime anew after undergoing penalties. Societies have been formed to help discharged prisoners to lead honest lives and prevent a recurrence of crime. In England these societies are known as the Discharged Prisoners Aid Societies, and since 1887 there has been one of these bodies attached to every prison in England and Wales. As their name indicates their purpose is to aid with money or encouragement persons who have served their sentences for crime. A recent report of the work of these societies during the year 1896 declares that many of them realize fully the objects for which they have been established. It is estimated that out of 169,137 discharged prisoners 26,000 received offers of help from these societies. The theoretical criticism of the purposes of these organizations rests on the ground that aid is due rather to the honest poor who are trying to lead respectable lives in spite of temptation than to those who have yielded to temptation and become criminals. The practical objection urged against some of these societies is that they do not keep up with the times in the knowledge of criminology and allow themselves to be swayed by philanthropic zeal which is often misdirected. Some of them have left the work to a few zealous members and the body as a whole has taken comparatively little interest in it. Yet it is admitted that the great majority of these societies have been well managed and that their influence has been for good. The Prison Commissioners have favored this plan of aiding discharged prisoners and have sought in so far as possible to promote its effectiveness.

Criminal Anthropology.—The school of Lombroso and Ferri has many disciples. While some of those who are intimately associated with criminals in the care or correction of them may deny the presence of any abnormal condition, and refer all crime to vice and "sinful desire," the vast majority of students of penal law and of the development of the criminal must admit that biological anomalies exist in the physical condition of delinquents. Lombroso has surpassed all former writers on this theme in covering a wider field of investigation, in imparting a more systematic character to his inquiries, and in drawing practical conclusions from them. The habitual criminal is to be distinguished from the average member of society by a much higher percentage of physical anomalies, consisting of malformations of the skull, brain and face, of the ear, eye and its protecting structures, nose, mouth, teeth and tongue, arms, and legs. There are also nervous and mental peculiarities and sexual anomalies. Lombroso places the criminal midway between the lunatic and the savage, as a product of pathological and atavistic anomalies. He reports the results of the examination of the crania of 609 criminals as follows:

	Per Cent.
Projecting superciliary ridges.....	46
Anomalies of the wisdom teeth.....	44
Closure of the sutures.....	43
Microcephaly	32
Plagiocephaly	25
Wormian bones	22
Simple suture	18
Median occipital fossa.....	16
Symbolic suture	13
Occipital flattening	13
Incus bone	14
Stenocrotaphy	10
Trochocephaly	9
Subscapocephaly	10
Oxycephaly	4

	Per Cent.
Coexistence of many anomalies.....	43
Isolated anomalies	21

From the study of 236 crania by Corre, Benedikt, Flesch, Roncoroni and Ardu, Lombroso compiled the following table:

	Per Cent.
Retreating chin	10
Obliquity of orbit.....	19
Enormously large upper jaw.....	19
Prognathism	69
Frontal process of the temporal bone.....	48
Anomalous nasal notch.....	48
Traces of the optic base.....	9
Synostosis of the atlas with the occipital bone.....	7
Sclerosis	36
Masculinity in women.....	9

In the brains of criminals were found anomalies in the depth and direction of certain fissures, superficiality and duplication and triplication of certain gyri, formation of opercula or uncovering of certain regions. Histological examination reveals the absence of the internal granular layer of the cerebral cortex, an exaggerated size and scarcity of the large pyramidal cells, and the presence of nerve cells in the white substance, as in the gallinaceæ (Roncoroni). Lombroso found, in 6,304 living criminals, a greater stature in the minor and a lower stature in the adult delinquent than in the normal individual. He found also in these delinquents darker hair, frequent facial asymmetry, inequality of the pupils, crookedness of the nose, a retreating forehead, prominent cheek and jaw bones, pale—occasionally paretic—faces, large ears and other anomalies, different sets of anomalies occurring in different types of offenders. An examination of 800 persons of good reputation by Lombroso revealed the presence of several of the characteristics mentioned, but rarely so grouped as to form a true criminal type. He has compiled the following table showing the proportion in which certain degenerative characteristics occur, based on a study of 25,000 individuals:

SIGNS OF DEGENERATION.

	With five or more.	With three or more.	Without or with one or two.
Normal.....	4 per cent.	24 per cent.	72 per cent.
Epileptics.....	29 "	55 "	16 "
Delinquents.....	27.4 "	88.5 "	89.4 "
Insane.....	26.8 "	55.2 "	18.4 "

Lombroso found 9 per cent. of adult and 40 per cent. of minor criminals were tattooed. He quotes Lacassagne's figures, 15.4 per cent. between the ages of 5 and 11 years; and Battistelli's figures, nearly 31 per cent. of minor criminals. Besides precocity and frequency, tattooing of delinquents expresses in the designs and mottoes chosen the violence, or vindictiveness, or moral obliquity of the individual. Special tests corroborate the inference that criminals possess diminished sensibility to pain. Ottolengui and Madame Tarnowsky found a marked diminution of olfactory and gustatory sensibility, as well as a diminution of vision in delinquents. Lombroso finds criminals affectionate, but yet dominated by pride, vanity, a spirit of vengeance, cruelty, lust and a love of drinking, gambling and revelry. He enumerates the following varieties of criminals: (1) epileptics and born delinquents, including the "morally insane;" (2) delinquents from passion and violence, the impulsive offenders in whom repentance and remorse follow quickly on the heels of the criminal act; (3) criminaloids, for whom the occasion furnishes the opportunity for the crime; (4) criminals from habit, consisting of the members of the last class, hardened and deteriorated by imprisonment and disgrace or debased by alcohol; and (5) insane criminals.

CRISPI, FRANCESCO. See ITALY (paragraphs on History).

CROATIA AND SLAVONIA are provinces in the kingdom of Hungary having a combined area of 16,773 square miles and a combined population in 1890 of 2,200,977. According to the official enumeration 85¼ per cent. of the total population are engaged in agriculture. In January 1896, a new survey showed that the extent of

land devoted to agriculture and gardening had steadily increased but the land devoted to higher cultivation had diminished with the exception of the vineyards. In the southwest and west the greater part of the forest and meadow land and the unproductive tracts is found. The Hungarian *Reichstag* has legislative authority for Croatia and Slavonia in regard to matters which are the common concern of those provinces and Hungary. The Croatian and Slavonian delegates, about forty in number, are allowed to speak their own language in that body although the official language is Hungarian. In the Hungarian executive departments there is a special minister for Croatia and Slavonia. The provincial Diet of these two provinces consists of 90 members chosen by the people and of certain dignitaries (not to exceed one-third of the Diet) holding their seats by inheritance or royal nomination. There is a low property qualification or the payment of a small tax required of all electors who do not practice certain professions. See AUSTRIA-HUNGARY.

CROUP. See PUBLIC HEALTH.

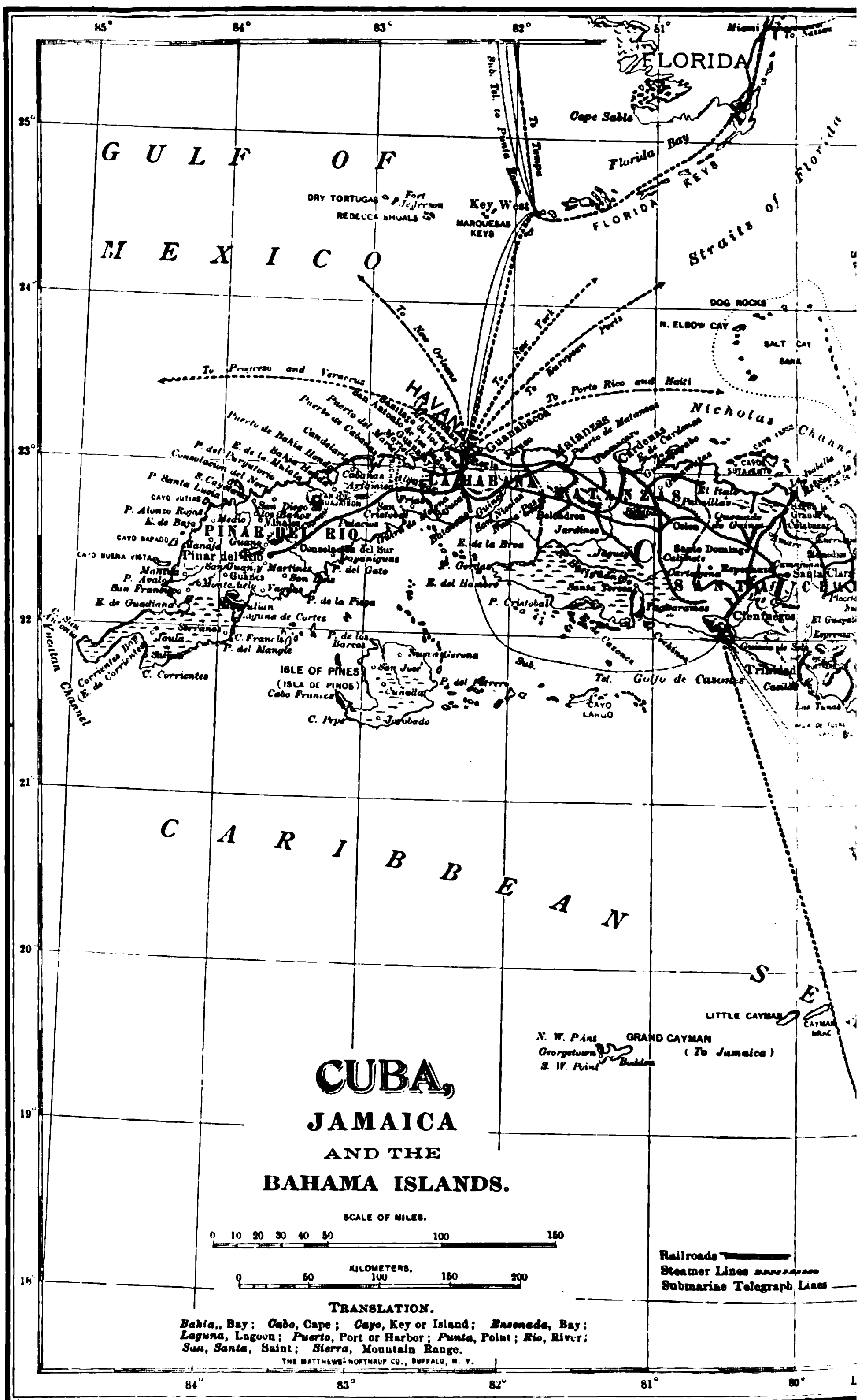
CRUGER, STEPHEN VAN RENSSELAER, died at Bayville, Long Island, N. Y., June 23, 1898. He was born in New York City, May 9, 1844: was educated there and in Europe, where he was at the outbreak of the Civil War. He immediately returned and received a commission as first lieutenant in the One Hundred and Fiftieth New York Volunteers. For gallantry at Gettysburg he was appointed adjutant of his regiment, which was soon assigned to Sherman's army. He was twice wounded in the battle of Resaca, was discharged, but was restored to his former command and participated in Sherman's march to the sea. He was promoted to a captaincy, was brevetted major and lieutenant-colonel for meritorious services in Georgia and the Carolinas, and was mustered out in June 1865. He then entered the real estate business in New York and became prominent in political, business, and social circles. He was comptroller of the Trinity Church corporation, and was connected as director and trustee with many large business corporations. He was a strong Republican and was a member of the most prominent clubs in New York. His wife was Miss Julie Grinnell Storrow, who writes over the pen name of Julien Gordon.

CRYSTAL-GAZING. See HYPNOTISM.

CUBA, the largest island of the West Indies, having an area about equal to that of the State of Pennsylvania, and a population estimated in 1887 at 1,631,687, of whom 528,998 were negroes and mulattoes. No trustworthy figures were available for the population at the close of the war in 1898. The capital is Havana, with a population of about 220,000. The coast line is very extensive, and affords a number of safe harbors. The northern coast is about 918 miles long and has thirty-two harbors; the southern is 972 miles long and has twelve important harbors. A chain of mountains traverses the island from southeast to northwest, the highest portion being found in the southeastern part. The soil of Cuba is well watered. Among the numerous streams may be mentioned the Cauto, 150 miles long, and the Sagua, 111 miles long.

Political Divisions and Cities.—Cuba comprises six provinces which were divided under the Spanish administration into three regions: the western including the provinces of Pinar del Rio and Havana; the central comprising Matanzas and Santa Clara; and the eastern comprising Puerto Principe and Santiago de Cuba. Havana, which under the Spanish rule was the residence of the Captain-General, and the seat of government is situated on the west side of the port of Havana, having an excellent harbor, the entrance to which is guarded by Morro and La Cabana on one side and on the other by the Punta and Reina batteries. It is well fortified, including besides the defenses mentioned the fortifications of Castillo del Principe, Fort Atarés, Fort No. 4, and other works. In the older parts of the city the streets are narrow, but outside the walls there are a good many wide avenues. The city is well provided with educational institutions, including a university, a school of fine arts, theological and normal schools, etc. Among its notable buildings are the cathedral, and the palace of the government. The city contains a navy yard, arsenal, gun factory and repair shops, and a large number of cigar and cigarette factories, tanneries, and manufactories of confectionery, rum, candles, gas, beer, carriages, soap, etc. Next in size is the city of Santiago de Cuba, which is situated on the southeastern coast of Cuba, and has a population estimated in 1895 at 59,614. Of the other important cities may be mentioned Matanzas, with a population of 49,384 in 1893, Cienfuegos (pop. 1895, 28,030); Cardenas (pop. 1893, 23,517); Pinar del Rio, the capital of the province of the same name (pop. about 30,000); Puerto Principe, capital of the province of the same name (pop. about 49,000); Santa Clara, (pop. about 32,000); Trinidad, (pop. about 29,000); Santi Espiritus, (pop. about 29,000); and Sagua la Grande. (pop. about 18,000).

Agricultural Resources.—The soil of Cuba is marvelously fertile and it is said that even when the same crops are grown on the same piece of land for a hundred



years, as in the case of the old sugar-cane fields, no artificial fertilizers are necessary. The exact figures for the proportion of the island which was cultivated are not available for the year 1898, but a large part of the surface is under forests, and some portions of the island are still unexplored. The chief products are sugar, tobacco, coffee, mahogany and other timber, honey, wax, and a great variety of fruits, including pineapples, bananas, oranges, mangoes, guavas, and cocoanuts. Of these sugar and tobacco are by far the most important. The growing and manufacturing of sugar were until the outbreak of the Cuban insurrection exceedingly profitable employments. It is said that the total sugar crop of any other West Indian island was barely equal to the output of three or four of the largest Cuban manufactories. The special advantages which Cuba possesses result from the increase in the size of sugar plantations, the fertility of the soil, the extensive rainfall which renders irrigation unnecessary, and finally, the proximity to the United States, which affords a good market for the product. The insurrection, followed by the Spanish-American war, greatly injured the sugar industry. During the insurrection the sugar planters and manufacturers suffered severe losses, and it is said that in 1895-96 there was a decrease of $77\frac{1}{2}$ per cent. in the total production. The average tobacco crop is estimated at 560,000 bales, each bale equalling 110 pounds. Cuban tobacco is of superior quality. It is produced in the largest quantities in the western part of the island, but there are some places where the production is considerable in the provinces of Santa Clara and Santiago de Cuba.

Cuban Ore Deposits.—Gold is found in the provinces of Santa Clara and Santiago de Cuba, but lack of capital has retarded its development; other veins are said to occur near Las Meloneras, El Descarso and Holguin. Both copper and iron are known in the province of Santiago de Cuba, and of the latter the most important deposits are those of the Juragua Iron Co., whose mines yielded 350,000 tons in 1893. Both iron ores and manganese from this province are exported to the United States for use in steel manufacture. Petroleum is known near San Juan in Santa Clara province and Languinilla in Matanzas province, while asphaltic shales outcrop not only in this latter province but also in Cardenas Bay, where their thickness is reported to be 70 feet.

Commerce.—For the year ending in April, 1896, the total value of the imports was \$66,166,754; of the exports \$94,395,536. The trade of Cuba has been mainly with the United States and Spain. There was a serious falling off in the amount of exports and imports in consequence of the insurrection and the Spanish-American war. In 1893 the trade of the United States with Cuba is given as \$78,706,506 imports from Cuba into the United States, and \$24,157,698 exports from United States to Cuba. In 1897 it had fallen to \$18,406,815, imports, and \$8,259,776, exports. The United States has received nearly all the tobacco and about one-half of the cigars exported from Cuba. Other Cuban articles which have found a market in the United States are fruits, molasses, wood, for manufacturing purposes, and iron ore. The exports from the United States to Cuba include hog products, wheat, flour, boards, deals, planks, joists, etc., coal, corn, locomotives, potatoes, mineral oil, boilers and parts of engines, carriages and street cars, etc. With Spain, which ranks next to the United States in the importance of its trade with Cuba, the imports from Cuba amounted in 1896 to \$4,257,360, and the exports to Cuba to \$26,145,800. Of other countries than Spain the most important in respect to their trade with Cuba and Porto Rico in 1896 were the United Kingdom, France and Belgium. The exports of sugar declined from 832,431 tons in 1895, to 235,628 tons in 1896. Owing, it is said, to the discriminating duties imposed by the former Spanish tariff in favor of Spanish products, the imports from the United States formed a relatively small proportion of the articles consumed in Cuba, yet the foreign trade with the United States as a whole was in normal years much larger than that with Spain on account of the great exports from Cuba. The trade with Spain consisted mainly of imports from Cuba to Spain.

Tariff.—The former Spanish tariff appears to have been framed solely in the interest of Spain and the rates levied were full of inequalities, and in some instances virtually prohibitory. When the province of Santiago de Cuba fell into the hands of the United States government, the latter country adopted as a temporary measure a rate of duty corresponding generally to the minimum levied under the old tariff, that is to say, the rates classed as revenue duties were adopted as a basis for the new tariff, although a duty was imposed on leaf tobacco, cigars and cigarettes. Imports from the United States were rendered dutiable like other commodities. A large number of articles were placed upon the free list. The tariff applied first to the province of Santiago de Cuba, but by the terms of its proclamation it was to be applied to all parts and places in the island of Cuba as soon as they should be occupied or possessed by the forces of the United States. A special commissioner was sent out by the United States to report upon the agricultural, industrial, commercial and financial conditions of the island. The report, which was made public

in November, 1898, recommends the substitution of a new tariff which would reduce all duties about 60 per cent. as compared with the old Spanish rates, and would place upon the free list cattle and agricultural implements. The commissioner said that the United States officials would be able to collect as much revenue on a tariff the duties of which were nearly two-thirds less than those levied by the existing law as the Spanish government had collected under the old system, since, owing to the dishonesty of the officials, a large part of the returns did not reach the Spanish government. It was expected that the reduction would result in a far greater importation and would increase the trade with the United States. The proposed tariff has regard to the home industries of Cuba, and aims not to reduce the duty beyond the protective point in such cases. Among the the classes of articles on which a reduction ranging from 60 per cent. to nearly 77 per cent. was proposed were the following: 1st, stones, earths, ores, etc.; 2nd, metals and metal manufactures; 3rd, chemicals; 4th, cotton manufactures; 5th, hemp, flax, jute, and other vegetable fibres and their manufactures; 6th, wool, bristles, etc., and their manufactures; 7th, silks and their manufactures; 8th, paper and its applications; 9th, wood and wood manufactures; 10th, animals, and animal wastes; 11th, instruments, machinery, etc.; 12th, food products.

Transportation and Communications.—In 1898 there were ten railway companies in Cuba owning over 1,000 miles of main line, besides which there were many private branch lines to the important plantations. The Western Railway, which was acquired by an English Company in 1891, connects Havana with Pinar del Rio. An English Company also owns the Marianao Railway, a short line connecting Havana with Marianao, and having a branch line to a village on the coast. Other lines join Cardenas and Santa Clara; Matanzas with Murga and Guareinas; Concha and Cruces; Cienfuegos and Santa Clara; Caibarien and Placetas, etc. Cuba is connected by cable with the United States, the West Indies, and South America. These lines and their branches include a cable from Havana to Florida; from Havana to Santiago de Cuba and Cienfuegos; from Havana to Jamaica, Porto Rico, the lesser Antilles and the Isthmus of Panama; and from Havana to Santiago de Cuba, Hayti, San Domingo, Venezuela and Brazil. The government owns the telegraph and telephone system, but has farmed out the latter to a private company for a term of years.

Finance.—The estimated revenue for 1897-98 was 24,755,760 pesos; the ordinary expenditures, 26,119,124 pesos; and the extraordinary revenue, 80,000,000 pesos. (The United States Treasury Department in 1898 placed the value of the peso at 92.6 per cent.). The Cuban debt on July 31, 1895, was estimated at \$295,797.264; in 1897 it was about \$350,000,000, and in the autumn of 1898, at the time when the Peace Commission was in session, it was estimated at \$500,000,000. The main sources of revenue under the Spanish rule were the customs duties, and the principal expenditures have been for those items which have had to do with Spanish control. The report of the special commissioner above mentioned gives the sovereignty expense as follows: (1) Interest on public debt and general expenses, \$12,574,700. (2) Religion and clergy (State religion and justice) \$329,072. (3) War, \$5,896,740. (4) Navy, \$1,055,136. (5) Executive, \$2,645,150. Total, \$22,500,808. No satisfactory estimates of the new budget were possible before the close of the year 1898, but it was thought that under a more economical management, far less revenue would be required for the necessary expenses of administration.

Currency.—The basis of the Cuban currency system is gold, but there are many kinds of depreciated currency in circulation. The gold coins current in Cuba are the Spanish twenty-five peseta, or "Alfonso," and the French twenty franc piece, or "Napoleon." The Spanish silver dollars in circulation have been taken at their daily value, which fluctuates with the changes in Spain's credit. In 1898 bank-note circulation was practically worthless, having sunk to less than ten cents on the dollar.

Education.—The latest report of the U. S. Commissioner of Education (published January 1899) gives the number of school children in Cuba, according to the report of 1889-90, the latest available, as 30,994 or nearly 2 per cent. of the total population. The condition of the schools at the end of the Spanish-American War, and the lack of any institutions of higher education in Cuba and Porto Rico, made it most desirable that some acts of concerted benevolence should be taken. A movement was accordingly started in New York to give the young men of Cuba some advantages of education in the institutions of learning in the United States. This work is being done by the Cuban Educational Association, organized by a few earnest American educators—Major-General Joseph Wheeler being president and Gilbert K. Harroun, secretary—for the purpose of accepting and administering the offers made by American colleges to give free tuition to two or more reputable Cubans each, competent to pass the necessary examinations to secure admission to such colleges. A large number of applicants from Cuba and Porto Rico asked

for allotment in the educational institutions of the United States, but had not the money to support themselves. Parents and guardians in some cases were willing to go under bond or to mortgage their property in order to guarantee the subsequent payment of money advanced for the support of the young men during the time of their education in the United States. To these requests the colleges of the United States made a generous response. The office of the secretary of the Cuban Educational Association is at 289 Fourth ave., New York City.

HISTORY.

For an account of the Cuban insurrection and the events in Cuba during the war, see the article **SPANISH-AMERICAN WAR**. The present article is concerned only with the affairs of Cuba after the war had closed.

Political Situation.—In spite of the slight feeling of jealousy betrayed by the Cuban forces at the close of the war in connection with affairs at Santiago, the President of the Cuban republic expressed in a proclamation the gratitude of the army and citizens of Cuba for the work of the Americans in liberating their country. Nevertheless there were signs of uneasiness among the people lest the United States should attempt to govern the island without consulting the wishes of the natives and there were signs too that the party formerly favorable to autonomy under Spanish rule were drawing toward the former insurgents in defense of the absolute independence of the island. The autonomists said it was their purpose to accept the existing order of things, meaning thereby the separation from Spain, and to unite with all who were in favor of Cuban independence. Commissioners were appointed by the United States and Spain to arrange for the evacuation of Cuba by the Spaniards. The Spanish commissioners were informed that the evacuation must be completed by December 1, but the difficulty of transporting so large a body of Spanish soldiers (estimated at 120,000), led to an extension of the time to January 1, 1899. Early in December the provinces of Puerto Principe and Pinar del Rio were evacuated.

Santiago.—After the capitulation on July 17, 1898, Santiago was occupied by the American troops. General Leonard Wood was made military governor of the department of Santiago and the vigor and efficiency which he showed in his administration attracted much attention. The city was in need of a thorough sanitary overhauling and General Wood applied American methods to the task with extraordinary energy. A street cleaning brigade was formed and the city of Santiago underwent a vast improvement. Under this provisional government civil liberty of the individual was guaranteed, the courts of justice were maintained, the rights of popular assembly, freedom of worship, habeas corpus and freedom of the press, as well as the other safeguards of individual liberty were declared. The building of roads from Santiago to Holguin and Guantanamo was begun and the supreme court composed of Cubans was installed on December 2. The Cubans themselves took up the work of improvement and in many instances cleaned and repaired their own houses.

Havana.—While the Spaniards were still in control of Havana there was much confusion. The Spanish troops showed a mutinous spirit on account of the delay in paying them and but for the prompt action of the authorities a rebellion might have broken out. The silver expected by General Blanco for the payment of the troops did not come and the latter were sent to Spain without pay. There was a mutiny of the Orden Publico but its leaders were disarmed and shipped to Spain. The Civil Guards also showed a mutinous spirit but they were suppressed and embarked. Affairs were kept from taking a serious turn largely through the sternly repressive measures of the military governor, General Arolas. For some weeks there was danger of an armed conflict in the streets of Havana, where large bodies of discontented troops were encamped. At times the enmity of the troops toward the Cubans broke out in street fights and riots. In one of these fracas on December 11 several Cubans were killed or wounded and on December 13 another outbreak on the occasion of a funeral procession resulted in the wounding of 11 persons. Several fatalities also occurred at a riot on December 18. The autonomist cabinet, which had been formed in accordance with the scheme of autonomy offered by the Spanish government, was dissolved on December 15. In the meanwhile General Blanco, the Captain-General of the island, resigned on November 23 and was succeeded by General Castellanos. Similar work to that done by General Leonard Wood at Santiago was also needed at Havana. There was an especial need of prompt action since American troops would have to be sent to take the place of the retiring Spanish garrisons. Accordingly the President of the United States and the War Department decided to appoint a commission of experts for the purpose of choosing camp sites and making recommendations as to supplies, drainage, transportation, etc., in advance of the sending of American troops. Colonel George E. Waring, Jr., volunteered his services on this commission and the offer was gladly accepted by the President.

Colonel Waring became the chairman of the commission and in addition to the task of preparing for the reception of the troops he was charged with the duty of inspecting sanitary conditions of Havana and the other cities of western Cuba with a view to recommending measures for the eradication of yellow fever. He entered upon his duties early in October and at the end of that month returned with a report which proved to be of the greatest value, but in the course of his work he contracted yellow fever and died soon after his return (October 25). The sanitary measures which he recommended would cost several millions of dollars but opinion was practically unanimous as to the necessity of promptly carrying them out.

Attitude of the Cubans Toward the United States.—On November 7 there was an assembly of Cubans at Santa Cruz where the disbandment of the troops and the future relations of the United States were discussed. One party, representing the extremists, opposed any further intervention on the part of the United States in the affairs of the island and especially the garrisoning of the cities by United States troops. A commission was appointed through the influence of General Garcia to prefer the requests of the Cubans to President McKinley, but its work was checked by the death of General Garcia in Washington on December 11. The Cuban army was not formally disbanded but individual applications for discharge were granted and here and there companies gave up their arms. After the Spanish evacuation parts of the Cuban army garrisoned many of the towns. One of the obstacles to disbandment was the lack of funds for the payment of the troops. It was said that only among an irresponsible element of the population was there any hostility toward the authority of the United States. There were signs at the close of the year that the business prospects of the island were improving and that American capital was seeking investment there. It was reported toward the close of the year 1898 that the demand for labor on the sugar plantations was on the increase, although there was surplus labor in Havana. A plan was proposed for conveying the able-bodied men who were in need of labor to the districts of the sugar plantations where labor was scarce on account of the great number killed during the war, or weakened by disease or starvation. It was also said that unemployed labor could be taken up in the mining industries if provision was made for its transportation.

Government.—Major-General John R. Brooke, U. S. A., was made Military Governor of the island, to assume control upon the formal evacuation by the Spaniards on January 1, 1899. His authority was coextensive with that formerly exercised by the Spanish Captain-General. At the close of the year Cuba was under a military government, being for military purposes a territorial division corresponding to the Territories of the United States. The headquarters of the division of Cuba were at Havana. Under General Brooke, Major-General Leonard Wood remained as governor of the eastern end of the island. Major-General Fitzhugh Lee was placed in charge of all the troops in the province of Havana; General Simon Snyder was in command in the province of Santa Clara, General L. H. Carpenter in Puerto Principe and General G. W. Davis in Pinar del Rio. The civil administration of Havana, which was separate from the military, was entrusted to Major-General William Ludlow, who was charged with all that related to the collection and disbursement of the revenues of the port and city and to its police, sanitary and general government under such regulations as might be prescribed by the President. In spite of the riots which took place in Havana during the closing days of the Spanish rule, the difficult and delicate work of transferring the control of the island from Spain to the United States was, on the whole, managed creditably to all parties concerned. The many problems to be solved in connection with Cuba as they appeared at the close of the year were the relief of the great distress caused by the war, the promotion of industry which had been almost paralyzed as a result of recent events, and finally the carrying out in the other cities of Cuba those thorough-going sanitary reforms which General Wood had introduced with such success in Santiago. As to the general political situation, it was clear that the leading men in Cuba were much concerned over the question of annexation to the United States. While many of them believed that the absorption of Cuba into the United States was the ultimate destiny of the island, they thought that the best plan for the present was to give Cuba her independence in order that she might work out her own form of government and adapt it to the needs of her people without interference from abroad.

CUBAN EDUCATIONAL ASSOCIATION. See CUBA (paragraph Education).

CUBAN FEVER. Cuban Fever or Calentura is the name given to a severe fever which attacked many of the American troops during service in Cuba or shortly after returning to this latitude. Its status was definitely settled by James Ewing of New York, who investigated the blood of 800 patients suffering from the disease. He found it to be a variety of malarial infection.

In 1880 Laveran discovered the parasite to which malarial fevers are due, and named it the *Plasmodium malariae*. It is not a bacterium, but an animal organism.

a protozoön. It is found in the blood of patients in the form of spores, intra-corpuscular bodies, segmentation forms or rosettes, crescents, rings, and flagellate organisms. The intra-corpuscular forms are so named because they pierce and enter the red corpuscles of the blood, during the disease. These parasites have always been found in malarial diseases, and never in the case of any other disorder. Each febrile attack, during the course of malarial fever, is accompanied by the appearance of a new generation of these parasites in the blood, being due, probably, to toxins set free by the young parasites. The disease can be communicated from one person to another by injecting the healthy person with blood from one suffering with malarial fever and containing the parasites.

Ewing found that 80 per cent. of the cases of Cuban fever were of the æstivo-autumnal type of malarial fever, the blood containing rings or crescents, or both forms of the plasmodium. Twenty per cent. of his cases were of the ordinary tertian type, and 4 per cent. showed double infection. Many of the æstivo-autumnal cases showed typical weekly recurring attacks, and these are commonly fatal on the third attack. Jaundice was pronounced in ten cases, all fatal. Nephritis of severe grade was found in but five cases. Anæmia was noted in all the cases examined, many showing the early changes of pernicious anæmia, some of secondary pernicious anæmia. The anæmia progresses for a long time after the blood is free from parasites. Typhoid fever coexisted with malarial fever in 40 cases of the 800. In such cases, malarial paroxysms reappear during convalescence.

CULLIS, GENERAL JOHN B., died at Lancaster, Wisconsin, September 24, 1898. He was a veteran of the Civil War, and, as a Congressman from Alabama, introduced the Ku-Klux Klan bill, which resulted in the stamping out of that organization.

CULLUM, SHELBY MOORE, senior United States Senator from Illinois, was born in Wayne county, Kentucky, November 22, 1829; received an academic education and later passed two years at Mount Morris University. In the autumn of 1853 he began the study of law in Springfield, where he has since resided. Upon being admitted to the bar he was elected city attorney. In 1856 he was a presidential elector on the Fillmore ticket, and was elected to the legislature by a coalition of the Fillmore and Fremont men. He was returned in 1860, 1872, and 1874, and was elected speaker in 1861 and 1873. He served from December 1865, to March 1871, in the national House of Representatives, being a member of the XXXIXth, XLth and XLIst Congresses. He was a delegate to the national Republican conventions of 1872 and 1884. In 1876 he was elected Governor of Illinois and was reëlected in 1880, serving until February 5, 1883, when he resigned to accept an election to the Federal Senate, to succeed the Independent Democrat, David Davis. Senator Cullum was reëlected in 1888 and 1894. In July 1898, President McKinley appointed him chairman of a commission of five to consider and report to Congress upon the questions of government in Hawaii.

CUMBERLAND PRESBYTERIANS report a very prosperous year. The educational institutions prospered by the additions to their funds, the theological seminary being the recipient of a bequest amounting to \$20,000. A missionary was sent to China by the Endeavorers. This branch of the Presbyterian Church reports for 1898, 3,021 churches, 1,691 ministers with 593 probationers and a membership of 180,635. A new Synod, called Indianola, was formed in Oklahoma and the Indian Territory; the woman's board of missions was entrusted with the work of erecting manses and given charge of the work among the mountaineers of the Appalachian Range. A constitution was proposed for the Church Extension Associations. The Colored Cumberland Presbyterians report 224 churches, 359 ministers, and 35,000 members.

CURACOA, a colony belonging to the Netherlands, consisting of the islands Curaçao, Aruba, Bonaire, St. Eustache, Saba, and the southern part of St. Martin, has a total area of 403 square miles and in 1895 had 48,744 inhabitants. The colony is administered by a governor assisted by a council. The revenue and expenditure for 1897 were estimated to balance at 702,216 guilders (the guilder is worth about \$0.406). The main sources of revenue are duties and taxes. There is a militia of about 400 men on the island of Curaçao and a garrison of about 240; a vessel of the Dutch navy constantly cruises among the islands. In 1895 there were about 28 schools with over 5,100 pupils; at the same time the Roman Catholics numbered 40,255, the Protestants 7,909, and the Jews 808. The principal products are maize, pulse, beans, cattle, lime and salt. In 1895 there entered at the various ports 2,695 vessels of 553,656 English tons.

CURRENCY REFORM. The advocates of currency reform made considerable progress during the year 1898. In order to understand this movement, a brief sketch of its history during the two preceding years is essential.

General Nature of the Movement.—For several years the attempt has been made to embody some scheme of currency reform in our national legislation. The advocates of reform have been able and earnest men, but for a long time their views were not harmonious and they failed to unite on a single plan. The general objections urged against the existing system were first that the government ought not to be in the banking business. So long as it is pledged to issue notes in response to the money demand there will always be, it is said, a feeling of uncertainty in regard to its ability or readiness to remit promptly. The banks have special means for knowing the money demand and their notes are drawn out readily in response to it, while the government has no means of adjusting its note issues to the needs of trade. Many have feared that inflationists might gain control of the Treasury to the great detriment of the public credit. Another objection urged against the present system was the so called inelasticity of the currency supplied by the banks. By inelasticity is meant the mal-adjustment of the circulation to the commercial demand. It was said that the bank-notes were not issued in sufficient quantities to supply the money demands. This was attributed of course to the too stringent rules governing their circulation. The note-issuing function was not made sufficiently profitable to induce the banks to undertake its adequate performance. As a result merely a small portion of the representative money of the country consisted of bank-notes, the rest being made up of silver certificates, silver dollars, treasury notes and greenbacks. A further objection to the existing monetary system was the alleged danger to the gold reserve. As the government is required to redeem the treasury notes and greenbacks in gold it must retain a gold reserve for this purpose. The panic of 1893-94 has been cited by the advocates of currency reform as a proof of the unsoundness of the system. If the banks, owing to the possession of more liberal privileges, were enabled to supply an adequate currency it was held that the government would be relieved from the constant strain upon its resources. Instead of redeeming greenbacks in gold and issuing new ones in their place,—the “endless chain” as it has been called,—the government would be able to withdraw from the banking business and retire the greenbacks. Such have been some of the most important arguments of the advocates of currency reform. The opposition has ranged all along the line from those who really favor fiat money to those who hold conservatively to the currency principle, and fear anything which looks like an extension of the banking principle. In the political campaign of 1896 promises were made by the “sound money” party that an honest effort would be made to improve the currency. For various reasons all action in the line of currency reform was delayed for some time. The advocates of reform measures, however, gained ground and the principal points of interest in the history of the movement to the close of the year 1898 are as follows:

The Indianapolis Monetary Conference.—At a meeting held in Indianapolis, December 1896, it was proposed that a national monetary conference should assemble in that city. This conference met on January 12, 1897, and consisted of 270 delegates representing trade and commercial organizations in twenty-four States chiefly in the north and east. The purpose of this body was to show Congress and the people that practical business men desired reforms in the existing currency and banking systems. The cardinal points in these reforms were first, the strict maintenance of the gold standard on a permanent basis; second, the banishment of the United States treasury from the banking business with the retirement of all kinds of United States notes; third, the rendering of the banking system safe and elastic. The conference appointed an executive committee to induce Congress to choose a monetary commission to report on the proper remedies for the present monetary evils. If the executive committee could not secure congressional action, it was to appoint such a commission itself. The committee went to Washington and tried to influence Congress to take the desired action. On July 24, 1897, President McKinley sent a message to Congress recommending the appointment of a non-partisan commission of well-informed citizens of different parties, entitled to the confidence of Congress and the people, whose duty it should be to recommend such changes in the present banking and currency laws as they deemed expedient. A bill embodying the policy recommended in the President's message passed the House but was killed in the Senate.

The Monetary Commission.—The executive committee now set to work to organize a monetary commission at Chicago. It succeeded in securing as members of this body some of the most prominent statesmen and financiers in the country. The chairman was ex-Senator George F. Edmunds of Vermont. The commission met on August 10, 1897. During the summer and fall sub-committees worked on a report which in December was submitted to Congress. This report was published on January 3, 1898. The new meeting of the commission was appointed to consider the report—January 20-26. The report was approved.

Recommendations of the Monetary Commission.—The chief recommendations of the monetary commission were as follows: In the first place, there was to be created a separate division of the Treasury in which would be deposited all funds held against outstanding gold, silver and currency certificates, silver bullion behind the Treasury and the guarantee and redemption funds of national banks as well as an amount of gold equal to twenty-five per cent. of all government notes and five per cent. of all silver dollars. All government credit money including silver dollars to be redeemed in gold with the exception of silver certificates which should be redeemed in silver dollars. Government and bank-notes to be in the denominations of \$10.00 and over; silver certificates under \$10.00. The issue of gold and currency certificates to cease.

Secondly, as to the retirement of government notes. The plan of the commission provides that government notes shall be paid out only in exchange for gold coin and currency certificates except that they may be used by the secretary at his discretion for the purchase of United States bonds; these notes to the amount of fifty million dollars to be canceled at once, then for the next five years to be canceled dollar for dollar with the increase of bank-notes, and finally after five years to be canceled one-fifth each year until cancellation is complete.

Thirdly, the gold reserve is to be replenished by the secretary from surplus revenues or by the sale of silver bullion or by borrowing in one of three ways: First, by the sale of three per cent. twenty year gold bonds payable after one year: Secondly, by the sale of three per cent. gold certificates of indebtedness payable in one to five years; Thirdly, by borrowing at not over three per cent. in sums not less than fifty dollars for which neither bonds nor certificates are issued, the record being kept in the books.

The Commission's Proposals as to the Banks.—The provisions in regard to banking are important. The limit of note issues is to be the amount of capital. The lowest denomination is ten dollars. For an amount of notes in excess of sixty per cent. of the capital a repressive tax of two per cent. is charged and on an amount exceeding eighty per cent. of the capital a tax of six per cent is charged. The notes to be legal tender to national banks and to the government except for duties on imports. As to the security for bank-note issues it is provided that government bonds shall still be deposited with the United States Treasury. But this does not mean that the note issues are in any way limited to the amount of the bonds. The amount of the bonds is only twenty-five per cent. of the capital and after five years the bond deposit is to be annually reduced one-fifth until in ten years it is extinguished. The main security for deposits is a common guarantee fund in gold coin equal to five per cent. of the circulation; all banks to be liable to assessment in case of the impairment of this fund. Another safeguard is the rendering of notes the first lien on the assets of the issuing bank and besides this stockholders are personally liable to the extent of their stock. As to redemption the present system of redemption by the government is to continue and each bank is required to maintain in the treasury a redemption fund to the amount of five per cent. of its circulation. No change is made in the present requirements in regard to reserves of the banks held against deposits, but a bank cannot count its deposits in the redemption or guarantee funds as part of its reserve nor its own notes as part of its cash assets. One-fourth of a bank's reserve must be in coin held in its own vaults. The number of banks permitted under these provisions is greatly increased, for there can be banks with a capital of twenty-four thousand dollars in places of four thousand population or less. The expenses of the Treasury are to be covered by a tax of one-eighth of one per cent. on capital surplus and undivided profits.

Purpose of the Proposed Changes.—Now the object of these provisions is to remove those defects in the present system which are enumerated by the commission as follows. First, too much government credit currency. Second, the continued circulation of government demand notes. Third, the failure of the currency to increase with the growth of the country. Fourth, the inelasticity of the currency. Fifth, the inadequacy of loanable capital. Sixth, the diversity of government credit money. Seventh, the difference between the nominal and the bullion value of the silver dollar. Eighth, an unsystematic bank currency. Ninth, the confusion of the Treasury's functions. Against the present banking system the commission has urged that it requires the continual issue of government bonds and does not contemplate the ultimate extinction of the debt of the United States; that the required investment in government bonds subtracts from funds which might be loaned to advantage; and, thirdly, that the bank currency is not flexible or elastic; that is, it does not increase with a temporary increase in the demand for currency or diminish with a temporary diminution. The commission thinks that these defects can be remedied by still maintaining a national banking system, but with improved regu-

lations as to examination, supervision, etc.; by basing the issues upon convertible assets instead of government bonds; by a limitation of the issues to the amount of the unimpaired capital of the banks; by a further security of a common guarantee fund as well as of the liability of the share holders to the full amount of their shares at par; by the maintenance of the present redemption fund and method of redemption.

Criticism of the Plan.—The plan proposed by the Monetary Commission is criticized not only by those who are opposed to all attempts to reform the present system by the extension of the banking principle, but also by men who favor such a reform, and yet believe that the Commission's scheme would not realize it when put into practice. The latter declare that under the system presented by the Monetary Commission the proportion of credit money in currency would not be lessened, for bank-notes would merely be substituted for government notes. The greenback and Sherman notes would be retired, to be sure, but in their place bank-notes would be issued. Yet it is acknowledged that banks might be compelled to increase their holdings of gold under this system. There is no positive assurance, however, that this would happen, for it is argued that under a system which permits the prompt issue of notes against general assets, a smaller cash reserve is necessary than under a system permitting note issues only against deposits of coin or bonds. A more serious objection urged against the proposed system is that it will not make the currency elastic. It is argued that as the bank-notes will have all the qualities of money, and will inspire such confidence that they will be accepted in all parts of the country, there is no probability that they will be presented for redemption as the needs of trade decrease. When a bank-note is limited in its circulation to a certain locality, its issue and redemption will conform to the fluctuations of trade. But if its security be so well guaranteed that it is accepted in any part of the country, the process of redemption will be slow, and not in conformity with the varying conditions of business. It is urged that if the plan of the Monetary Commission is adopted, there is no reason why three-fourths of the money payments in excess of \$10.00 should not be effected by means of bank currency, and some of the opponents of the measure maintain that such a currency would be no more elastic than that which is supplied under our present system. There is further criticism of the plan in respect to almost all of the points which its framers urged on its behalf. It is denied that it will lessen the strain on the National Treasury. It is held it will tend to increase the proportion of credit money, that it may cause contraction when expansion is needed, and that it offers opportunity for fraud. Space is lacking for the consideration of the opposing arguments on these points. The friends of the measure—and they include some well-known and able financiers—regard it as certain to put an end to the existing monetary evils.

Secretary Gage's Plan.—In the President's Annual Message of December 6, 1897, he urged strongly the need of currency reform, and gave a brief outline of a plan. But the plan outlined by the Secretary of the Treasury, Lyman J. Gage, contained the features of the President's scheme, and was far more carefully worked out. Mr. Gage's plan received the endorsement of the President.

The following outline of Secretary Gage's plan is taken from *Annals of the American Academy of Political and Social Science*, March 1898.

"1. *Issue and Redemption.*—Create separate division of treasury for issue and redemption of all kinds of government and paper money. Transfer to it \$125,000,000 gold, and silver dollars and bullion equal to outstanding silver certificates and treasury notes. Do not issue redeemed United States notes, treasury notes, or silver certificates except in exchange for the coin in which they are redeemed.

"2. *Refunding Plan.*—Authorize the issue of 2½ per cent. gold bonds, redeemable after ten years at option of the United States, to be exchanged on an equitable basis for the government 5's of 1904 and the 4's of 1907; also authorize an issue of \$200,000,000 of said 2½ per cent. bonds in addition to the amount needed for making said exchanges.

"3. *Banking.*—Limit the issue of bank-notes to capital. Lowest denomination \$10. Two kinds of circulation: the first secured by United States bonds of a par and market value equal to the face of the notes; the second unsecured and restricted in amount to 25 per cent. of the bonds deposited against the secured circulation. A bank must deposit bonds equal to 50 per cent. of its capital before notes may be issued.

"(a) *Deposit of Government Money.*—A bank, in lieu of bonds, may deposit as security for its notes, United States notes, treasury notes or silver certificates. But not more than \$200,000,000 of such government money can be so deposited, and the secretary may, at his discretion, substitute for it 2½ per cent. bonds, the money then becoming part of the general redemption fund.

"(b) *Redemption.*—Each bank to maintain in the Treasury a redemption fund equal to ten per cent. of its circulation. The notes to be redeemed at the Treasury

and at designated sub-treasuries. 'The faith of the United States is hereby pledged' to the prompt redemption of the notes.

"(c) *Safety Fund*.—Each bank to pay a tax of two per cent. per annum on its unsecured circulation; the proceeds to be a safety fund to reimburse the United States for redemption of unsecured circulation. It may be invested in government bonds.

"(d) *Miscellaneous*.—(1) A tax of one per cent. on circulation, except that issued against the deposit of government money. (2) Banks of \$25,000 capital to be permitted in places of 2,000 population or less. (3) Present law as to legal tender character of bank-notes not changed."

The Merits of the Gage Plan.—It will be seen from this that Secretary Gage's plan proposes to reform the currency without departing radically from the present system. The danger to the gold reserve would be averted, he thinks, by locking up the United States Treasury notes and silver certificates, and preventing their reissue except in exchange for the coin in which they are redeemed. Bonds are to be retained as the security for national bank-notes, but the national debt is to be refunded at 2½ per cent., and the issue of notes is to be made more profitable to the banks by the provision that notes may be issued up to the par value of the bonds deposited, and that an emergency circulation equal to 25 per cent. of the bonds, and taxed at the rate of two per cent. per annum, may exist along with the secured circulation. The establishment of a separate division in the Treasury for the redemption and issue of notes is a feature of both plans. This scheme appeals to the conservative men. The security remains ample, and undoubtedly the relaxation of the present rules in regard to the issuance of notes would increase the volume of bank currency. Bank-notes would take the place of a great part of the government credit money. \$200,000,000 in government notes and silver certificates may be deposited by the bank in lieu of bonds. After this, \$50,000,000 would be tied up in a redemption fund. These sums, together with the amount of bank-notes issued under the present system, bring the total to \$500,000,000, which would have to be replaced by the new notes. Secretary Gage estimates the reduction of the government's demand obligations at about \$500,000,000. The banks will step into the breach and supply the requisite currency, greatly lessening the strain upon the government. There will remain, according to Secretary Gage's reckoning, \$360,000,000 of government obligations. He thinks that the amount of government credit money being so greatly reduced there will be far less difficulty in maintaining the gold reserve. On account of the scarcity of government credit money the banks will be able to redeem in gold as easily as in government paper. This would be true if the exportation of gold bore an exact ratio to the amount of government paper money in circulation, but it is doubtful if it does. Some think that the exportation of gold depends rather on the inelasticity of the currency. If this latter view is correct, exporters would find no difficulty in obtaining gold, and the drain on the treasury would not be lessened. If, however, the secretary's plan renders the currency more elastic, the danger to the gold reserve will be lessened. The emergency circulation is of course designed to adjust the amount of issues to the needs of the trade. Its success would depend on the question whether it would really tend to expand in times of stringency, or contract in periods of inflation. If the security of the notes are such that they would be accepted from one end of the country to the other even when they are based merely on general assets, it is hard to see how they would show any greater elasticity than the present currency. The imposition of a tax, however, upon such emergency circulation, would tend to make it conform to the demands of business, if the tax were high enough to prevent the banks from resorting to emergency circulation under normal conditions. Whether 2 per cent. would accomplish this result is a question to be decided by experts.

The Teller Resolution.—The other plans for changes in the currency system do not require detailed discussion. President McKinley's proposal was confined to the facilitation of the maintenance of the gold standard. It consisted of the simple requirement that on the retirement of the greenbacks they should not be reissued except in exchange for gold. During the early part of 1898 there was considerable discussion in the Senate over the currency question, and an interesting but not very profitable debate was occasioned by the introduction of a resolution on Jan. 20, by Senator Teller, of Colorado. This resolution was as follows:—

"*Resolved*. By the Senate (the House of Representatives concurring therein), that all the bonds of the United States issued, or authorized to be issued, under the said acts of Congress hereinbefore recited, are payable, principal and interest, at the option of the government of the United States, in silver dollars, of the coinage of the United States, containing 412½ grains each of standard silver, and that to restore to its coinage such silver coins as a legal tender in payment of said bonds, principal and

interest, is not in violation of the public faith, nor in derogation of the rights of the public creditor."

The McCleary Bill.—The measures proposed by the Monetary Commission and Secretary Gage together with certain proposals made by Congressmen Walker and Fowler were laid before the Committee on Banking and Currency of the House of Representatives, which after considerable discussion submitted a bill to Congress on June 15. There being no hope of passing the bill through the Senate the friends of the measure withdrew it from further consideration. In the meanwhile the war with Spain had arisen and Congress was engrossed with pressing matters relating thereto. Some alterations in detail were afterwards made in the bill, but it is worth while here to consider some of the chief points in the original measure and especially some of the arguments urged for it in the accompanying report which was one of the most important statements on the currency question that has appeared in recent years.

Features of the Plan. "National Reserve Notes."—Among the provisions of the bill was one creating a new division of issue and redemption in the Treasury Department, this division to be under the charge of three comptrollers of the currency and to manage all affairs relating to the issue, redemption and exchange of currency whether coin, government notes, or bank notes. To this division should be transferred by the Secretary of the Treasury "all funds in excess of a cash balance of \$50,000,000 and all gold and silver coin and bullion not held in the Treasury for the purpose of redeeming United States notes, Treasury notes and certificates." Among the other important features of the measure are the provision for a new form of currency to be known as "national reserve notes" which shall take the place of the existing greenbacks with a view to relieving the government of the United States from the burden of redeeming its demand obligations. These national reserve notes are "government notes whose current redemption is provided for by the banks. They are a legal tender and are intended for circulation as currency or for use in the reserve of the banks in exactly the same manner as the existing greenbacks. National reserve notes are to be issued to any national bank to any amount not exceeding its paid up capital upon its surrender to the Treasury of an equal amount of greenbacks." The banks exchange these national reserve notes for United States notes which are thereupon cancelled and destroyed. There is to be a current redemption fund for the reserve notes and this is to consist of contributions from the note-issuing banks to the extent of 5 per cent. of the amount of their reserve notes in gold coin. Thus the government is relieved from the burden of the current redemption of its demand notes and at the same time the money in circulation is not reduced, for the greenbacks as they disappear are replaced by national reserve notes in equal amounts.

Elasticity.—In return for this service of the banks in redeeming the United States notes they have the privilege of issuing currency notes upon general assets and of enjoying a partial remission of a tax of $\frac{1}{4}$ of 1 per cent. each year levied upon the capital surplus and undivided profits of each bank. At the same time that any diminution in the existing amount of currency from the withdrawal of the government from the banking business is prevented by this device of the national reserve notes, the bill aims to secure elasticity of the currency by permitting the banks to issue notes based upon commercial assets without the deposit of United States bonds. Such notes, however, are not to exceed 40 per cent. of the paid up capital of the banks and can be issued only upon condition that bond-secured notes and national reserve notes be taken in equal amounts. The issuance of notes on the basis of bonds is to continue but the banks may issue notes upon bond deposits to the par value of the bonds instead of to 90 per cent. of the par value as at present. The committee gives the following illustration of the working of this plan: "Thus a bank organized under this bill having a capital of \$100,000, is required to take out \$25,000 in national reserve notes and to have on deposit in the Treasury \$25,000 of United States bonds, against which it may issue \$25,000 in national bank-notes. It may also issue \$25,000 additional in such notes based upon commercial assets, and may increase such issues if it increases also its bond deposits and its holdings of reserve notes in equal proportions. This process may be continued up to the point where the amount of notes secured by bonds, the amount of notes not thus secured, and the amount of national reserve notes are each equal to 40 per cent. of the paid-up capital, making an aggregate of \$80,000 in bank-notes and \$40,000 in reserve notes." A tax of $\frac{1}{2}$ of 1 per cent. each month may be imposed on notes issued in excess of 80 per cent. of the paid-up capital exclusive of issues of reserved notes. "But bond-based notes may be issued to the full amount of the capital without any tax on them." The redemption of the paper currency thus rests with the banks, which must redeem reserve notes over their own counters and maintain a 5 per cent. gold fund in the Treasury for the redemption of notes in gold. The government guarantees the ultimate redemption of these reserve notes in case the bank fails.

Alleged Advantages of the Plan.—Such are the main points of the bill as summarized by the committee in its accompanying report. The most striking feature of the

measure is the method of dealing with the greenbacks and in regard to this the report makes the following arguments:

"In dealing with the existing legal-tender notes of the government your committee have endeavored to adopt a system which would be subject to none of the criticism made against the issue of interest-bearing bonds or the taxation of the people for the payment of this demand debt. While the arguments are strong for the adoption of one of these methods of paying back to the creditors of the United States the money thus borrowed for the preservation of the Union, the system adopted is such as to continue to the government all the benefits of the loan without any of the disadvantages of its character as a demand obligation. The proposed bill places upon the banks the burden of providing for the current redemption of the greenbacks.

"The form of the proposition submitted by your committee makes that portion of the demand debt which is not now covered by gold in the Treasury a loan by the banks to the government. This loan is made without interest and without any compensation to the banks except what is afforded them in getting their franchise as national banks and thus securing the power to issue a banking currency, which is granted in other sections of the bill. There is no other profit or return to the banks in thus carrying the nation's debt, except a small remission of the new franchise tax.

"This policy is not without precedent in that of European governments, but the privileges granted by those governments are enormously greater, because they are granted to a single bank having a monopoly of all the note issues of the country. The Bank of France, for instance, makes the government a loan without interest, which has just been increased to 180,000,000 francs, or about \$35,000,000; but this loan is substantially offset by the deposit of the treasury with the bank, which amounted on January 7, 1898, to 212,268,560 francs, or 32,000,000 francs in excess of the entire sum advanced to the government. The government of Austria-Hungary has an advance from the Austro-Hungarian Bank amounting to about 75,000,000 florins, or \$30,000,000; but this is in process of annual reduction by the amount of the profits of the bank, charged as a government tax, but actually employed for the reduction of the loan. There are illustrations of several similar cases, but they serve to show that no country imposes so heavy a burden upon its banks as this bill provides, unless under the pressure of dire necessity, as in the cases of the governments of Spain, Portugal and Italy.

"The banks are required to redeem this debt of the government now assumed by them upon precisely the same terms as the current redemption of their own notes while they are conducting a solvent banking business. It is only when, by the refusal to pay such notes, they become insolvent, that the government recognizes again its demand debt and reassumes it for the complete protection of the holder of the note and for the benefit of the creditors of the bank by leaving the remaining assets unimpaired for the settlement of their just claims. The form of note thus assumed by the bank with the final redemption guaranteed by the government combines the strongest of all resources for its ultimate payment. The note which it is proposed to issue under this bill in lieu of the government notes is called the national reserve note, a designation which may be taken to imply at once that it has behind it not only the banking resources of the issuing bank, but the reserve strength of the national government, and also that it is peculiarly available for money reserves of all kinds. It is, moreover, a legal-tender note, whose parity with gold is assured so long as the banks maintain the parity of their notes, and for whose parity the government is also responsible, if it is conceivable that the government should maintain specie payments while the banks were unable to do so."

The Secretary's Report.—In his report on the state of the national finances submitted to Congress December 6, 1898, Secretary Gage took his stand firmly on the principles of the monetary bill before Congress. He made the following summary of the arguments for effective currency and banking reforms: "The power of the bank note * * * will always be restored in full upon the call of industry. The power of our present currency, on the contrary is not suspended. It is inevitably misdirected. It artificially stimulates speculative activity in securities at the centers. It periodically absorbs the credit powers at times when they should be made serviceable to the whole country. It ministers to the speculator, it prejudices the producer, the merchant, and the manufacturer, though, at last, all suffer from its deranging influences.

"These are the reasons, the most important reasons, why our banking system should be reformed and made effective to commercial and industrial needs; and these same reasons, with others not here set forth, call for the elimination, in a safe and proper way, of the injurious interference in our currency system by the legal-tender paper money of the government.

"If it be conceded that the legal-tender money issued by the government does not possess the qualifications to make it a proper factor in the country's exchanges of

products and manufactures; if the fact also be admitted that it is a deranging and disturbing factor in its relation to industry and commerce, then the time has come to substitute for it a currency which will adequately, economically, and safely meet the ever-growing needs of the country, rapidly developing, as it is, in the power of production, in the number of its people, and the importance of its domestic and foreign trade.

"The total circulation of failed banks outstanding at the time of failure, up to Oct. 31, 1897, was \$20,893,827. The loss upon these notes, if the security for them had been impaired in the same degree as the security for other liabilities, would have been \$5,379,165, or an annual average of about \$163,000. This loss would have been made good by a tax of about one-twelfth of 1 per cent. per year upon the circulation of the solvent banks. A tax of one-fifth of 1 per cent. upon the average circulation of the National banks since the foundation of the system would have paid such losses up to Oct. 31, 1897, amounting to \$5,379,165, and left a surplus of about \$9,000,000 in the guaranty fund.

"Whether preference be given to the note holder, as in Canada, or he be made to take his share of the risk with the depositor, as in Germany, France, and Scotland, or whether the note holder shall be protected by the special pledge of security as now provided in our National Banking act, these considerations affect the questions relatively, not absolutely. Under either of these conditions provisions may be made which will furnish to the country a paper money adequate to commercial needs, economical to the people, and safe in its general workings.

"In the nature of things the banker is the proper agency for operating this important function. He must have motive for his action or he will not exercise it. Given this motive he will, like the laborer, the merchant, or the professional man, be diligent in the employment of his powers. That this motive must be the motive of gain does not differentiate the bank from other working forces of society, whose actions are healthful and helpful to the social whole.

"In my last report I ventured upon specific recommendations. These recommendations, if adopted and formulated into law, would, in my opinion, be curative of the evils herein pointed out. In House Bills Nos. 10,289 and 10,333 are embodied a series of measures in some respects more meritorious. The measures therein proposed are the result of careful study by expert and experienced men. With some modifications—the reasonable fruit of full discussion—they would, I believe, meet the country's needs. I commend the subject to the early and earnest attention of Congress."

American Economic Association's Report.—The last important contribution to the discussion of the currency question during the year was the following report of the Currency Committee of the American Economic Association at the latter's annual meeting on Dec. 27-29, 1898.

"*I. The Need of Reform.*—Despite the fact that much improvement has taken place within two or three years, there still exists a real need for monetary and banking reform in the United States. The standard of value upon which the whole system rests is by no means as secure as it should be. The circulating note system is still greatly lacking in elasticity. Adequate banking facilities for newer, or more backward, districts are still wanting. In the system as a whole, there is a notable lack of unity and organization.

"In citing the first particular, *i. e.*, the insecurity of the monetary standard, as a proof that currency reform is needed, your committee do not mean to imply that the existing standard is the only possible one, or even the most desirable one. It is merely assumed that, so long as that standard is retained, it should have the utmost possible security; since the unquestioned security of the monetary standard is indispensable to a high degree of industrial prosperity.

"It is possible, however, to argue that the defect in question no longer exists—that the stability of the gold standard is now substantially assured. There is unquestionably much force in this contention. Besides a number of temporary circumstances, such as a full treasury, a large gold reserve, and a favorable trade balance of exceptional amount, several changes of a more permanent character have contributed to the improvement of the situation. We cite particularly the repeal of the provision in the act of 1890 to issue Treasury notes in purchase of silver, and the insertion in the war-revenue bill of a clause which authorizes the Secretary of the Treasury to make loans at his own discretion to meet temporary deficits. In fact, under the laws now in force, a Secretary who desires to maintain the gold standard need have no difficulty in doing so. But this is only one side of the case. It is equally true that, because of inconsistencies in these same laws, it is possible for a Secretary so disposed to overthrow the gold standard, even though it continue to be the declared policy of the nation to maintain that standard. There thus remains in the situation an element of uncertainty which is needless and which cannot but prove harmful.

"As respects the need for elasticity in the note system, next to nothing has been gained. In the first place, we still retain for our bank circulation the system of bond security, and under that system it is in the nature of the case extremely difficult, if not impossible, to secure in the currency that prompt and easy adjustment of volume to need which constitutes genuine elasticity. In defence of this statement, much might be said, but it may suffice to call attention to a single consideration. If bank circulation is to be elastic, the assets which are required as a security for that circulation must be such as a bank ordinarily has in its possession; since, in a stringency when expansion is needed, the bank already has its resources locked up, and consequently cannot without great difficulty get hold of new assets. But government bonds are not a kind of assets which banks will, or usually ought to, have on hand in considerable amounts. The special office of banks is to provide funds for the everyday business of the country, *i. e.*, to invest their resources, not in a supply of bonds to furnish the basis of a possible issue of notes, but in commercial paper, grain bills, and the like. As a result of all this, the amount of notes which, under our system, most banks issue, is that amount which can be kept in circulation substantially all of the time. Fluctuations in the need for such notes, there is almost no attempt to meet.

"In the second place, we have not attained in our circulation even that degree of elasticity of which a bond secured system is capable. At the outset, we disregard the fundamental principle that, in order to be elastic, a circulation should be profitable. That this is a fundamental principle needs little proof. The necessity of profitability to secure expansion is self-evident. In securing contraction, on the other hand, profitability, if less necessary, is not less effective; for, in making each banker anxious to expand his own circulation, it leads him promptly to send home the issues of his neighbors in order to make room for his own. Thus, from the single fact that the circulation is fairly profitable are derived two opposing forces which work respectively for the expansion and for the contraction of the currency as a whole. Further, the relative strength of these opposing forces is largely determined, as it should be, by the needs of business. If more notes are wanted in the ordinary circulation, they will be swifter in going out, and, since they will not naturally get into the hands of bankers, slower in being sent home to the issuer. If, on the other hand, fewer notes are needed, they will be slower in going out and more prompt in coming back; since, when idle, they will naturally accumulate in the banks and by them will be sent home. It is thus evident that a reasonable degree of profitability is a most important requisite of an elastic currency. Now it is a commonplace that our bank circulation is not a profitable one. Most banks deposit bonds to the least amount permitted by law, and do not always issue even the quantity of circulation corresponding thereto. It is true that conditions have in this respect measurably improved, the lower price at which bonds are now available having rendered the conditions of issue somewhat more profitable; but it is practically certain that this process has not been carried sufficiently far to furnish the necessary conditions for an elastic currency.

"But again, even an increase in profitability cannot avail unless the machinery of issue and redemption is efficient. The forces which work respectively for expansion and contraction must have easy and unimpeded action. At this point our present law is not only inadequate, it is positively evil. It limits the amount of circulation which may be retired during any one month, and prohibits reissue for six months after retirement, thus actually putting a premium on inelasticity. Further, the machinery of issue and redemption is unnecessarily slow and clumsy. Even if a bank decides to expand its circulation, the process can seldom be completed till the special need has passed. In like manner, contraction cannot usually be brought about till long after a plethora has worked much harm.

"The foregoing remarks have more especial reference to the experience of ordinary times; for the case of the monetary panic, when there arises a demand for an immediate and very great increase in the stock of current moneys, absolutely nothing has been done. We thus have every reason to expect that, should another crisis as serious as that of 1893 overtake the nation, we should experience a monetary famine of equal severity and should again be obliged to resort to numerous extemporized devices very doubtful as to their legality and still more doubtful as to their efficiency.

"What has been said concerning the continued lack of security and elasticity applies in substance to every other recognized need of the monetary system. Almost no progress has been made. It thus becomes evident that the only method by which we can insure that, when less favorable conditions arise, there shall be no recurrence of the disasters formerly experienced, is to bring about some more or less fundamental changes in the monetary system itself.

"II. *The Security of the Standard.*—Under existing conditions, the only wise and consistent policy for the United States is the frank recognition of the fact that the actual monetary standard is now, and for some time to come will be, gold, and the adoption of legislation which shall insure the entire stability of that standard, until

such time as the nation may have decided to establish some other. Assent to this statement does not commit any one to the position that the gold standard is, abstractly considered, the most desirable one. As is well known, a large number of economists hold to the opposite opinion. But, as is also well known, the particular substitute which such economists favor, *i. e.*, international bimetallism, is at present, and for a long time will be, out of the question. In consequence, the precise form which the question of standards now takes in the United States is as to whether the currency shall rest on a gold basis or on a silver or paper basis. Thus stated, it can have, to the majority of economists, but one solution. Under existing conditions, the gold standard is, for the United States, the best available. This being the case, it is the duty of the nation to render that standard as stable as possible and to remove all uncertainty as to its maintenance and its easy working; for uncertainty as to the basis of the currency must always be a menace to prosperity.

"With respect to the means through which increased stability for the standard shall be insured, it is hardly to be doubted that much would be gained by its explicit definition in terms of gold. Still more important would be the enacting of such legislation as shall insure that the task of maintaining the standard, or, in other words, of maintaining the convertibility into gold of other forms of currency, shall be efficiently performed. At this point, your committee find themselves in accord with the commonly received opinion that, under normal conditions, the task in question can most advantageously be devolved upon some institution or institutions of a banking nature. We are also agreed, though perhaps less positively, that, even under the conditions which must prevail in the United States, this same solution of the problem is, on the whole, best. If, however, this plan shall prove impracticable—if the task of maintaining the standard of value is still to rest upon the Treasury—everything calculated to make that task an easier one should be done, and the department should be specially organized with reference to the duty thus devolving upon it, and provided with such additional powers as are necessary to insure its fitness for the work in hand. Among the various changes which would tend to the accomplishment of these objects, your committee believe the most important to be some modification of the existing system whereby the duties of the Treasury as respects the management of the monetary system of the country shall be separated from those functions which are of a purely fiscal nature. It would doubtless be well, also, to find a place for silver where it will cause least trouble, by retiring all notes under ten dollars, and to authorize the Secretary to withdraw, at least temporarily, United States notes which have been once redeemed.

"*III. The Banking System. (a) Elasticity.*—Whatever decision may be reached with reference to the much disputed question as to whether United States legal-tender notes shall continue to hold their place as part of the paper currency of the country, it is certain that the maintenance of some system of bank issues will be indispensable. This system should, without doubt, be under Federal control and should take such form as to insure much greater elasticity than exists in the present system provided always that the security of the issue shall be in no wise impaired.

"As respects the method to be employed for attaining this needed increase in elasticity, it is believed that the really successful one must involve issuing some portion of the circulation upon ordinary banking assets. The chief reason for this, as already indicated, is that such ordinary banking assets are the only ones which are universally and readily available when expansion is needed. The superiority of such a system is further insured by the fact that there is a very close correspondence between the amount of such assets in the possession of the banks and the need of the community for currency; since these assets, like the need for money, vary in amount with the volume of business. As respects the security of such notes, there need be no anxiety, provided the system is supplemented with the device of a safety fund, or with one or more of the various other expedients which have been proposed. If it be urged that nothing can make this system really safe, at least for the banks considered as guarantors of each other's notes, so long as the securities on which these notes are based remain in the custody of the issuing bank, the objection might be met by enacting that notes of this character shall be issued only through clearing-house associations, which are to hold in trust the commercial paper or other collateral by which the notes are secured, just as they now do in the case of loan certificates, and as the Treasury of the United States does in the case of national bank-notes.

"It may, however, prove impossible to secure legislation of the character described. In such event the existing system of notes based on United States bonds should be amended so as to give to it as large a measure of elasticity as is possible. The provisions of the law of 1882 which limits the amount of notes that may be retired in any one month and prohibits reissue within six months after retirement should be repealed. To secure in some degree that increase in profitableness which, as we saw earlier, is indispensable to elasticity, it would be well to raise the ratio of notes to bonds deposited and to lower the tax, or, better still, to levy it on capital and surplus.

In order still further to enlist the self-interest of the banks, especially on behalf of the prompt retirement of redundant notes, we should be inclined to prohibit any bank from paying out the notes of any other bank except to the issuer or to the redemption agency. As respects making easier the processes of expansion and contraction, some gain would result from requiring the Comptroller to keep on hand a supply of notes in blank, and still more from an increase in the facilities for redemption.

"In order to furnish the sort of elasticity which is needed in a panic, it is even more necessary than in ordinary times to depend on general banking assets for the security; since at such times few banks have any resources left with which to purchase government bonds. To insure that some portion of the power of issue should be reserved for such occasions, as also to secure its prompt retirement after the special need has passed, there is probably no better expedient than that already tried in Germany, *i. e.*, levying on such circulation a tax so high as to be in ordinary times prohibitive. It would seem that the natural way to apply this general plan both safely and effectively would be to intrust its elaboration and management to the Clearing-house Associations, which have already worked out an analogous scheme in the loan certificates that have done much service in former crises.

"(b) *Country Banking*.—As already remarked, there is a real need for increased banking and currency facilities in the newer or more backward parts of the country, and legislation could do something towards satisfying this need. In the judgment of your committee, the most effective as well as the safest expedient for accomplishing this object is some system of branch banking so constructed as to supplement, but not displace the present system of independent banks. Under such a plan, banking facilities can be furnished to communities too small to support even the smallest independent bank of issue, and capital can be most cheaply and easily transferred from districts oversupplied to those needing it; while, at the same time, the dangers of fraud or mismanagement incident to all banking are far less serious than under a system of small independent banks. There are doubtless objections to the plan, but the experience of other countries has shown that they are not of great moment.

"If, however, the apparent tendency towards excessive concentration of capital shall prove too strong an objection to this system, other alternatives offer themselves. A decision to permit the issue of any portion of the circulation upon general assets would greatly increase the banking facilities of the country districts, since the chief obstacle at the present time to the establishment of national banks of issue in such districts is to be found in the circumstance that they could not afford to invest their capital in assets so unproductive as United States bonds. Another but rather more doubtful remedy for the difficulty in question would be the exemption from the Federal ten per cent. tax on circulation, of such State banks as should comply with the regulations of Federal law and submit to Federal supervision. This change would, without doubt, greatly increase banking facilities, and, probably, it would prove quite safe. Again, a lowering of the minimum capital for a national bank from the present figure to twenty or twenty-five thousand dollars would be better than nothing, and would probably work no evil effects of any moment.

Conclusion.—In conclusion, your committee cannot refrain from expressing the conviction that it will be a genuine misfortune if the very notable movement towards monetary reform, which has filled so large a place in the history of the last few years, shall pass away without having left any results in legislation. Never before has there existed among all classes so great an interest in this subject, so near an approach to unanimity of opinion, and so strong a purpose to see something accomplished. To this very promising attitude of the public mind, are added external conditions of an extremely favorable character. We allude to the exceptionally large stock of gold, both in the Treasury and in the country at large, to the unprecedented trade balance, to the generally solid condition of business, to the absence of any necessity for that haste which makes legislation in a crisis dangerous. A conjuncture in so many respects favorable we can scarcely hope to meet again in the near future. Its utilization would, therefore, seem to be commended by every consideration of prudence and good judgment.

"Without doubt, there are still considerable obstacles in the way of reform. It is easy, however, to exaggerate the seriousness of those obstacles. Your committee wish particularly to remark this in respect to the much-noted divergencies of opinion among friends of reform. The not uncommon opinion that these divergencies are so serious as to render hopeless the prospects of reform, we consider quite unwarranted. As a matter of fact, barring differences due to the circumstances of some being more, others less, radical, the various projects of reform have a surprising similarity. Doubtless there are differences of method so fundamental that the choice of one plan involves the rejection of its rivals; but cases of this sort are comparatively few. An analysis of a large number of plans of reform discloses the fact that, of the various expedients proposed in them for accomplishing the several objects sought, a considerable proportion appear in nearly every one of the plans.

"In the light of these facts, your committee are of the opinion that what is most needed at this juncture is a disposition on the part of the friends of reform to sink individual preference as to details, and to insist that Congress shall enact such legislation as it may be possible to agree upon. Undoubtedly there is room in this matter of currency reform for honest differences of opinion, but such a degree of persistence in one's opinion as makes a working compromise impossible has no justification in monetary principles, or in the conditions prevailing in the United States. It is safe to say that, of the five or six currency bills that, during the last twelve months, have been in any serious sense before the country, the passage of any one would have resulted in great improvement, and would have measurably satisfied the demands of reformers."

For further discussion of currency matters see the articles BANK—BANKING, BI-METALLISM, UNITED STATES, RUSSIA, INDIA, JAPAN, and other countries; also the table following the article MONEY.

CURRIER, MOODY, ex-Governor of New Hampshire, died in Manchester, August 23, 1898. He was born in Boscawen, New Hampshire, April 22, 1806. After his graduation at Dartmouth College in 1834 he taught school and studied law, and was admitted to the bar in Manchester in 1841. In 1843-44 he was a Democratic State Senator. He soon became prominent in financial circles and in 1864 was made president of the Amoskeag National Bank. The slavery question led him to join the Republican party, and when the war broke out he performed valuable service in raising and equipping troops. He was a presidential elector in 1876, and an unsuccessful candidate for Governor in 1882; but in 1884, he was elected by a large majority. Mr. Currier was always interested in religious and educational institutions, and never discontinued his literary and scholarly pursuits.

CURZON, GEORGE NATHANIEL, M. A., Lord of Kedleston, Viceroy of India, was born at Kedleston, Derbyshire, January 11, 1859. He is the son of Lord Scarsdale; he was educated at Eton and at Balliol College, Oxford. In 1885 he became assistant private secretary to the Marquis of Salisbury; from 1886 to 1898 he was a Conservative Member of Parliament from the Southport Division S. W. Lancashire. In 1891-92 he was Under-Secretary of State for India; from 1895 to 1898 he was Under-Secretary of State for Foreign Affairs, and in the former year was made a Privy Councillor; upon his appointment to the viceroyalty in 1898, to succeed Lord Elgin, he was raised to the peerage. The appointment was looked upon with some disfavor both by Indian natives and by the Russian government. The latter regards Lord Curzon as an Englishman who is particularly opposed to Russian advance. Adverse comment also arose in England; it will not do, however, to prophesy disaster to his administration, for he has shown great political sagacity and ability. He is a progressive man and a supporter of the "forward" policy; his appointment was taken as a sign that a vigorous policy would be adopted in the East. Lord Curzon has traveled widely in Central Asia, Afghanistan, the Pamirs, Persia, Siam, Indo-China, and Corea. In 1883 he received the Lothian essay prize at Oxford and in 1884 the Arnold essay prize; in the former year he was made a fellow of All Soul's College, Oxford. The gold medal of the Royal Geographical Society was awarded him in 1895. Lord Curzon has published the following works: *Russia in Central Asia*, 1889; *Persia and the Persian Question*, 1892; *Problems of the Far East*, 1894. He married in 1895 Miss Mary Victoria Leiter, daughter of Mr. L. Z. Leiter, the Chicago financier.

CYCADACEÆ. See BOTANY (paragraph Spermatozoids in Gymnosperms, etc.).

CYPRUS, which is one of the largest islands of the Mediterranean, lies 41 miles from the coast of Syria. It is now a dependency of Great Britain, having been granted to her in 1878. It has an area of 3,584 square miles with a population in 1891 of 209,286. Its capital is Nikosia with a population of 12,515. Agriculture is the chief occupation and there is a considerable exportation of the products of the soil. The island is said to have derived much advantage from the English rule. Its foreign trade is considerable, and the shipping, entering and clearing at its ports has increased in recent years. The revenue, which is derived chiefly from tithes, customs duties, excise, stamps, etc., has been for many years steadily in excess of the expenditure. The executive authority is entrusted to a British High Commissioner aided by an executive council and legislature of 18.

CYTOLOGY (VEGETABLE). See BOTANY (paragraph Cytology).

CYRANO DE BERGERAC. See ROSTAND.

CZECHS, a branch of the Slavonic race, who settled in Bohemia and Moravia about the middle of the fifth century A. D., having migrated thither from the north-east. They still constitute by far the great majority of the population of those provinces. Besides the Bohemians and Moravians, the term Czech includes the Slovaks

who occupy the northwest part of Hungary and there are other Czechs gathered in communities in several parts of the crown-lands. According to the enumeration of 1890 the Czechs in the Austro-Hungarian monarchy numbered 7,410,388 of whom 3,644,188 were in Bohemia, 1,590,513 in Moravia, 1,937,517 in Hungary, 129,814 in Silesia, and 93,481 in Lower Austria, etc. They have preserved their racial spirit which in late years has been the cause of much political disturbance in the affairs of Austria-Hungary. For an account of the part which they have played in the recent history of political parties see the articles AUSTRIA-HUNGARY and BOHEMIA.

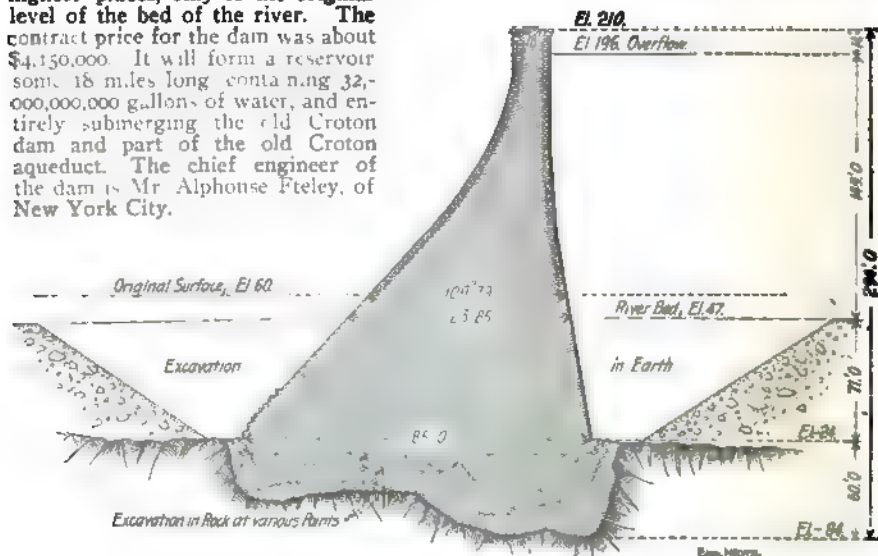
DAHLGREN, Mrs. MADELINE VINTON, a literary and society woman of Washington, died in that city May 28, 1898. She was born about 1835 at Gallipolis, Ohio. In 1859 she published sketches and poems under the pen name "Corinne" and subsequently she used the name "Cornelia." At an early age she married David Convers Goddard, of Zanesville; Mr. Goddard died and in August 1865, his widow married Admiral Dahlgren. Her greatest literary activity began after the Admiral's death in 1870; during the succeeding years she actively opposed the woman's suffrage movement. She was one of the founders of the Literary Society of Washington and for a number of years was President of the Ladies' Catholic Missionary Society of that city. Her writings on social and general topics were more successful than her poetry or fiction. Her book on official etiquette has long been a standard authority. Among her works are: *Idealities*, 1859; *Thoughts on Female Suffrage*, 1871; *South Sea Sketches*, 1881; *The Social Official Etiquette of the United States*, 1881; *A Washington Winter*, 1882; *South Mountain Magi*, 1882; *Memoirs of John A. Dahlgren*, 1882; *Lights and Shadows of Life*, 1886; *The Lost Name*, 1886. She translated the following works from the French, Montalembert's *Pius IX*, and De Chambrun's *Executive Power*; from the Spanish, Donoso Corte's *Catholicism, Liberalism, and Socialism*.

DAHOMEY is a West African dependency of France on the Gulf of Guinea between the British Gold Coast and the Niger territories. It comprises two distinct divisions, namely the native kingdom of Dahomey, a French protectorate, under the direct government of a native prince, with a population of about 150,000, and the colony of Dahomey, comprising the Benin settlements on the coast with a population of about 400,000. The Benin settlements have been united for administrative purposes with French Guinea (q. v.) but are under the direction of a local governor resident at Kotonu. The total area of Dahomey is about 14,000 square miles. The people are said to be industrious and the products exported include palm oil, maize, cattle, ivory and India rubber. The capital is Abomey. The kingdom was one of the most important states on the slave coast in former years but French activity has resulted in a curtailment of its territory as well as of its power. In 1892 the French came into conflict with the King of Behanzin and having invaded his country and defeated him placed the present ruler, Guthili, on the throne. In 1893 the French declared the kingdom a protectorate with the exception of certain divisions which were formed into a colony and afterwards united administratively with French Guinea. In 1897 and 1898 the back country of Dahomey was the seat of conflicting claims on the part of France, Germany, and England. The delimitation of the French and German spheres in this region was accomplished by a convention between France and Germany signed on July 23, 1897. By this France obtained a far wider though less productive tract of land than Germany. Here, as is generally the case with territorial disputes in Africa, the question was complicated by the sharp practice of the native chiefs who made treaties simultaneously with both powers or laid claims to a wider extent of territory than they had a right to. With Great Britain the dispute took on a more serious character. Each country declared that the other had been the aggressor and at one time French and English troops were facing each other in the hinterland with a prospect of collision at a very early date. From the French point of view the Niger Company had no just claim to this territory in the treaties which it had made with the native chiefs. The especial point in dispute was the possession of the pagan kingdom of Bussa whose capital of the same name had been occupied and garrisoned by a French force. This town lies in the hinterland of the British dependency of Lagos and it was claimed by the Niger Company that treaties with the native chiefs covered this entire district. Nevertheless the French advanced into it and finally a French officer stationed himself at Bussa in the capacity of a French resident. By the close of the year 1897 it was evident that a conflict could be averted only by an international commission for the claims of the two powers were irreconcilable in principle. See the article NIGER TERRITORIES.

DAMES OF THE REVOLUTION, an organization established in 1896, consisting of members who are descended from an ancestor who contributed in any way towards the establishment of American independence during the War of the Revolution, 1775-1783. President, Mrs. Edward Paulet Steers; Vice-President and Registrar, Mrs.

Montgomery Schuyler; Second Vice-President, Mrs. John F. Berry; Secretary and Historian, Mrs. Mary A. Phillips, 19 W. 38th street, New York; Treasurer, Mrs. J. Wesley French, and Librarian, Mrs. Francis E. Doughty.

DAMS. The largest dam under construction in this country and probably in the world, is now being built to form an immense storage reservoir for the water supply of New York City. It is known as the New Croton dam, because it is located on the Croton river, a few miles below the original Croton dam. At its highest point this dam when completed will be 290.8 ft. high and 216 ft. thick at the base. This portion is of solid masonry and will decrease in height and thickness each way from the point of maximum cross-section. The length of the masonry portion, measured along the top, will be 700 ft. To the south of this the dam will be continued as an earth structure, about 500 ft. long, with a masonry wall in the center. To the north, the dam turns nearly at right angles to the main structure and extends 1,050 ft. upstream, its top being enough lower than the main dam to allow waste waters to spill over the top of this section—hence the name spillway, or wasteway. The contract for the dam was awarded in the summer of 1892. Some four years or more were required to do the necessary preliminary work of diverting the river and excavating for the foundations before the contractor could begin to lay stone on the dam proper. At the close of some six years of work the main dam had been brought up, in the highest places, only to the original level of the bed of the river. The contract price for the dam was about \$4,150,000. It will form a reservoir some 18 miles long containing 32,000,000,000 gallons of water, and entirely submerging the old Croton dam and part of the old Croton aqueduct. The chief engineer of the dam is Mr. Alphonse Fteley, of New York City.



Cross-Section of the New Croton Dam.
(From *Engineering News*.)

Steel has recently been used in dam construction in California and Arizona. In the Lower Otay dam, built 22 miles S. E. of San Diego, Cal., by the Southern California Mountain Water Co., of San Diego, a 14,000,000,000 gallon reservoir is formed by a dam 130 ft. high and 545 ft. long on the crest, composed of loose rock or stone filling, with a vertical core, or diaphragm. The plates range from about $\frac{1}{3}$ to $\frac{1}{4}$ in. in thickness. To protect the plates from rusting they were painted with semi-liquid asphalt and to guard them against damage from the rock filling a thin wall of cement mortar was built up each side of the plate. Water will not be allowed to discharge over the top of the dam, but will be carried in a wasteway constructed at one side, whenever any is to be wasted.

The Arizona dam is built entirely of steel, except for masonry abutments at each end. It was built by the Atchison, Topeka & Santa Fé Ry. Co. to supply its engines and incidentally to furnish water to the village of Ash Fork, Ariz., near which it is located. It forms a reservoir of 36,000,000 gallons capacity. The steel portion of the structure is 184 ft. long at the top and its greatest height is 46 ft. It consists of a series of triangular steel frames, against the upper sides of which rest the riveted steel plates, $\frac{3}{8}$ in. thick, which hold the water back. These plates are curved so as to form a series of channels from the top to the bottom of the inclined face of the dam, with flat strips between. The two masonry abutments have a combined length

of about 116 ft. Water will flow over the top of the steel dam. This form of dam was suggested and designed by Mr. F. H. Bainbridge, of Chicago, under the direction of Mr. James Dun, Chief Engineer of the A. T. and S. F. Ry. Co.

DANUBE, NAVIGATION OF THE. Great improvements have been made in the navigation of the Danube in recent years. On September 27, 1896, the new passage through the Iron Gates was formally opened. It will be remembered that the navigation is under the direction of a mixed commission composed of representatives of the riparian powers. The European Commission which has charge of the improvements of the navigation of the Danube, decided on May 9, 1898, to straighten the channel of the Sulina branch by a cutting five miles long, 400 feet wide, and 20 feet deep. This commission was formed in accordance with the Peace of Paris in 1856 and its work in improving the Lower Danube has resulted in greatly facilitating the navigation of that portion of the stream. The improvements proposed in 1898 would, it was estimated, be completed in five years. The river is already navigable by vessels of 3,000 tons burden between the ports of Braila and Galatz. In September 1898, it was reported that the canal at the Iron Gates would be free to navigation without tolls till further notice. In 1897 a monopoly was granted to a German firm by the Servian government, including the right to use the cataracts of the Danube for water power and to work mines and quarries along the banks. In the autumn of 1898 it was reported that this German firm had suspended its operations pending an inquiry to be made into the Servian concession, the Hungarian government having objected to the contract.

DARFUR, with an estimated area of 200,000 square miles and an estimated population of 1,500,000, is one of the provinces of the Soudan which after the Mahdi's revolt was lost to Egypt. It was reduced by Ziber Pasha in 1874, but after the Mahdist rebellion appears to have asserted its independence. It lies on the frontier of Wadai, and its capital is El Fasher. It is within the area claimed by Great Britain according to agreements with Germany and Italy in 1890 and 1891, and the British claim is further strengthened by Great Britain's position in Egypt as a guarantor of the restoration to the latter power of her authority over the lost provinces of the Soudan.

DARTMOUTH COLLEGE, at Hanover, New Hampshire, chartered in 1769, is Congregational and for men only. Connected with the college proper are the medical school and the Thayer school of civil engineering. In 1898 there were about 80,000 volumes in the library. The officers of instruction of the college, the medical school, and the engineering school numbered for the year 1898-99, 59; the students numbered in the college, 581; in the medical school, 131; in the engineering school, 11; total, deducting names inserted twice, 697. The academic and medical courses are four years in length, and the engineering course two years. The degrees conferred in 1898 were as follows: B. A., 37; B. S., 21; B. L., 11; C. E., 5; M. D., 24; M. A., 4; Ph. D., 1; D. D., 2; LL. D., 1. President since 1893, William Jewett Tucker, D. D., LL. D.

DATE LINE, INTERNATIONAL. See INTERNATIONAL DATE LINE.

DAUGHTERS OF THE AMERICAN REVOLUTION. Organized Oct. 11, 1890, in Washington, D. C., in which city are its headquarters. The members are any women who can prove descent from an ancestor who "with unfailing loyalty, rendered material aid to the cause of independence as a recognized patriot, as soldier or sailor, or as a civil officer in one of the several Colonies or States, or of the United Colonies or States." Regents preside over the State chapters existing in 44 States and Territories, and the District of Columbia. The membership is about 25,000. President General, Mrs. Daniel Manning; First Vice President, Mrs. A. G. Bocket; Secretaries-General, Mrs. Albert Ackers, Nashville, Tenn., and Mrs. Kate K. Henry, Washington, D. C.

DAUGHTERS OF CUBA, a patriotic society of women, organized in 1895, for promoting Cuban Independence. Membership, 100. President, Mrs. Gonzalo de Quesada; Secretary, Miss C. Mantilla. Headquarters, 116 W. 64th street, New York.

DAUGHTERS OF THE CINCINNATI, a woman's society corresponding to the Sons of the Cincinnati (q. v.), founded in 1894. Mrs. Howard Townsend, President; Mrs. Morris P. Ferris, Secretary, Dobbs Ferry, New York.

DAUGHTERS OF THE HOLLAND DAMES, founded to collect and preserve historical documents and to honor the memory of the early Dutch period in America. The members are descendants of "ancient and honorable families of New York."

DAUGHTERS OF THE KING, THE, an organization older than the King's Daughters (q. v.), being founded in 1885. It is distinctively Episcopalian, being more of an order than a society, and corresponds somewhat to the Brotherhood of St. Andrew (q. v.), as its purpose is "the spread of Christ's Kingdom among young women." President, Mrs. E. A. Bradley; Secretary, Miss Elizabeth L. Ryerson.

DAUGHTERS OF THE REVOLUTION, organized in New York in 1891. Membership is restricted to women who are lineal descendants of an ancestor who was a military, or naval, or marine officer, soldier, sailor or marine in actual service under the authority of any of the thirteen Colonies or States, or of the Continental Congress, and "remained always loyal to such authority, or descendants of one who signed the Declaration of Independence, or of one who as a member of the Continental Congress or of the Congress of any of the Colonies or States, or as an official appointed by or under the authority of any such representative bodies, actually assisted in the establishment of American independence by service rendered during the War of the Revolution, becoming thereby liable to conviction of treason against the government of Great Britain, but remaining always loyal to the authority of the Colonies or States." President, Mrs. Harry S. Snow, Brooklyn, N. Y.; secretaries, Mrs. L. Holbrook, New York, and Miss Virginia S. Sterling. Headquarters, 156 Fifth avenue, New York.

DAVENPORT, FANNY LILY GIPSY (Mrs. Melbourne MacDowell), actress, died of enlargement of the heart at her summer home in Duxbury, Massachusetts, September 26, 1898. She came of a histrionic family, her father being the well-known actor, Edward L. Davenport. She was born in London, England, April 10, 1850, was educated in the public schools of Boston, Mass., and in childhood determined to make a livelihood on the stage. Her first public appearance was in 1862 and, according to her own statement, she supported herself from the age of fourteen. Her career was marked by steady progress until she became, under the management of Mr. Augustin Daly, one of the foremost American actresses in high comedy. Later she achieved much success in "emotional" rôles, among the most important of which were "Fedora," "Theodora," "Cleopatra," and "Camille." It was upon these and other serious rôles that her reputation for the last twenty years of her life was based; many critics, however, maintain that she would have been even more successful had she kept to her earlier style in comedy. Her genius, like that of her father was certainly very versatile; in the course of her career she appeared in almost every kind of legitimate drama, including the Shakespearean comedies. Miss Davenport was a woman of great personal attraction, and to this fact her popularity was doubtless in part due; her art was high, but not of the highest order. During her long connection with Mr. Daly's company she was associated with many of the most famous American actors. She left the management of Mr. Daly in 1878 and subsequently began a series of starring tours. She was married in 1879 to actor Edwin F. Price, from whom she was divorced some ten years later; she soon married Mr. Melbourne MacDowell, who survives her.

DAVIES, SIR LOUIS HENRY, M. P., K. C. M. G. (created 1897), Canadian Minister of Marine and Fisheries, was appointed a member of the Anglo-American Joint High Commission which was created in May, 1898. (See CANADA, paragraphs History.) He was born in Charlottetown, Prince Edward Island, May 4, 1845; was educated at Prince of Wales College; became a barrister in 1867; Solicitor-General for Prince Edward Island, 1869, and 1871-72. In the assembly he was leader of the opposition, 1873-76, and during the next three years was Premier and Attorney-General. He became Queen's Counsel in 1880; two years later was elected to the Dominion House of Commons and has since been continuously returned. In 1877 he was counsel for the British government before the International Fisheries Arbitration at Halifax between the United States and Great Britain. He has been prominent in educational matters.

DAVIS, Colonel CHARLES W., Commander of the Loyal Legion, died in Chicago, Illinois, December 16, 1898. He was born at Concord, Massachusetts, October 11, 1833; served in the Civil War as adjutant of the Fifty-first Illinois Infantry, rising by successive promotions to the rank of colonel in May 1865; he took part in the engagements at Island No. 10, Corinth, the Cedars, Chickamauga, and Missionary Ridge, where he was severely wounded. Colonel Davis accepted the surrender of General M. J. Thompson in Arkansas.

DAVIS, CUSHMAN KELLOGG, Republican United States Senator from Minnesota, was born at Henderson, Jefferson county, New York June 16, 1838; was graduated at the University of Michigan in 1857; studied law. In the Civil War he served as a first lieutenant in the Twenty-eighth Wisconsin Infantry, 1862-64; was elected to the legislature of Minnesota in 1867 and from 1868 to 1873 held the office of District Attorney. In 1874-75 he was Governor of Minnesota, in 1887 succeeded S. J. R. McMillan in the Federal Senate, and was re-elected in 1893. When John Sherman retired from the Senate to become Secretary of State, March 5, 1897, Mr. Davis was appointed Chairman of the Foreign Relations Committee. On August 26, 1898, President McKinley appointed him one of the five commissioners to negotiate a treaty of peace with Spain.

DAVIS, Miss VARINA ANNE ("WINNIE"), the "Daughter of the Confederacy."

died at Narragansett Pier, Rhode Island, September 18, 1898. She was a daughter of Jefferson Davis and was born in the Southern White House, Richmond, Virginia, June 1864. She had no small ability as a musician and painter, and gained some reputation as an essayist and story writer. Among her writings are: *An Irish Knight of the Seventeenth Century*; *The Veiled Doctor*; *On Summer Seas*; and *Foreign Education for American Girls*, which was one of her last articles.

DAY, WILLIAM R., an Ohio lawyer but little known to the general public when he came to Washington in April 1897, to become Assistant Secretary of State, achieved a marked success in his diplomatic relations during the first eight months of 1898. Mr. Day was born at Ravenna, Ohio, April 17, 1849. He comes from a family of lawyers, both his grandfathers having been Supreme Court judges in Ohio and his father having been Chief Justice of Ohio for many years. He prepared for college in his native town, was graduated from the School of Arts, University of Michigan, in the class of '70, and having been admitted to the Ohio bar, practised law at Canton. In 1886 Mr. Day was elected Judge of the Common Pleas Court of the Ninth Judicial District of Ohio, but in the following year he resigned. President Harrison in 1889 appointed him United States District Judge for the Northern District of Ohio, but he was obliged to decline this honor on account of poor health. Mr. Day was chosen by President McKinley to institute a personal investigation of affairs in Cuba, but, before he could leave, the President called him to the office of Assistant Secretary of State. It was known in Washington at this time, April 1897, that Secretary of State Sherman, by reason of age and weakness could perform little more than the nominal and formal functions of his office. And yet the venerable statesman could hardly be expected to resign as he had left his seat in the United States Senate to become the head of the State Department. The actual labor and responsibility of the Department devolved upon the Assistant Secretary. When Mr. McKenna was appointed to the Supreme Court, the President offered Mr. Day the Attorney-Generalship but he declined. Mr. Day had shown such marked ability in diplomatic affairs that, when Mr. Sherman was obliged to resign by reason of the enormously increased work of the Department occasioned by the troubles with Spain, President McKinley made the former Secretary of State, April 1898. At the same time, at Mr. Day's request, Professor John Bassett Moore, of Columbia University, was made Assistant Secretary. Upon the signing of the protocol between the United States and Spain in August, Mr. Day was placed by the President at the head of the Peace Commission which met with the representatives of Spain at Paris in October. This necessitated his resignation from the State Department (September 16).

DEATH RATE. See PUBLIC HEALTH.

DELAGOA BAY is a large bay on the southeast coast of Africa which forms the southern end of the Portuguese province of Lourenço Marques in Portuguese East Africa. As one of the most important harbors on the entire eastern coast and as the natural outlet for the trade of the interior, its possession has been greatly desired by Great Britain. For a long time Great Britain disputed the Portuguese title but the question was decided in favor of Portugal in 1875. During recent years there have been various reports in regard to the designs of Germany respecting Delagoa Bay and the attempts of Great Britain to purchase it from Portugal. It is the objective point for trade from the Transvaal, but the border of the Transvaal lies 52 miles inland. The Delagoa Bay Railway extends from the coast to the Transvaal frontier at Komati, whence it has been extended to Pretoria, the capital of the Transvaal. This makes Pretoria 350 miles by rail from the sea and Johannesburg 400 miles. The extension of the road in the territory of the Transvaal is the property of the Netherlands South Africa Company. The total length of the road in 1896 was 382 miles. In 1889 the line was seized by Portugal and the claims for compensation led to long negotiations. A tribunal of arbitration was assembled at Berne in Switzerland, but its proceedings dragged on and it had rendered no award at the close of 1898. In the spring of that year, however, the British Under Secretary for Foreign Affairs, Mr. Curzon, announced that experts who had been employed to investigate the case had presented their report. It was then supposed that the decision would soon be rendered, but this was not the case. In August 1898, an agreement was made between Great Britain and Germany in regard to their respective possessions in Africa (see TOGOLAND), and it was rumored that Germany had consented to any arrangement that Great Britain might choose to make respecting Delagoa Bay or other possessions of Portugal. The details of this agreement were not published in 1898, but the belief was current that the control of Delagoa Bay was about to pass to England and the British papers referred in a triumphant tone to the exclusion of the Transvaal from access to the sea.

DELAWARE, a State of the United States, area 2,050 sq. m. Capital, Dover.

Agriculture.—Chief crops with their value in 1898 were: corn, 5,219,600 bu., \$1,118,076; wheat, 988,762, \$682,246; oats, 386,914, \$116,074; buckwheat, 5,296, \$2,118;

potatoes, 251,664, \$173,648; and hay, 71,684 tons, \$605,730—total value, \$2,697,892. Live-stock comprised, horses, 30,883; mules, 4,928; milch cows, 35,376; other cattle, 22,995; sheep, 12,981; and swine, 50,556—total head, 157,719.

Transportation.—In 1897 the railroads under State charter had a total length of 317.77 miles. A new one was opened from Greenwood to Queenstown, Md., and one was projected to connect Lewes and Seaford. The Delaware Railroad was again leased to the Pennsylvania company for a term of thirty years.

Banks.—On October 31, 1898, there were 19 national banks in operation and none in liquidation. Delaware was the only State that reported all her national banks in operation. The aggregate capital was \$2,133,985; deposits, \$5,514,349; circulation, \$1,568,213; and resources, \$9,888,089. There were 4 State banks, with capital, \$680,000, deposits, \$1,136,059, and resources, 2,579,182; two loan and trust companies, with capital, \$1,000,000, deposits, \$2,644,796, and resources, \$4,108,518; and a mutual savings bank, with deposits, \$848,126, and resources, \$981,480.

Government.—The new constitution, which went into operation in 1897, made many radical changes in the fundamental law of the State. The number of State Senators was changed from 9 to 17 and of Representatives from 21 to 35. Presiding officers have a per diem allowance of \$6; all other members \$5. Sessions of the legislature are unlimited, but members will be paid for a service of 60 days only. The Governor is made ineligible for a third term instead of a second as formerly, and is given the veto power, subject to the passage of an act over his veto by a three-fifths vote of each house. The office of Lieutenant-Governor is created, and provision is made for the succession of officers, in case of death, disability, or removal of the Governor, in the manner usual in other States. The Court of Errors and Officials is abolished and a Supreme Court created in its place, consisting of a chancellor, chief justice, and four associate justices, all appointed by the Governor with the consent of the Senate, for terms of 12 years, and with salaries of "not less than \$3,000" per annum. Hereafter clergymen may hold civil offices while regularly engaged in ministerial work. The Attorney-General, Insurance Commissioner, Treasurer, and Auditor are now chosen by popular vote at the general elections. The State is divided into four districts for the purpose of providing for local option; a State board of agriculture is created; and the board of pardons consists of the Lieutenant-Governor, Chancellor, Secretary, Auditor and Treasurer. A new qualification for a voter is the ability to read the State constitution and to write his name. Any person who shall attempt to bribe a voter or interfere with the lawful expression of the people's will at the ballot box will be subject to a fine of from \$100 to \$5,000 or imprisonment for from one month to three years, or both. Under specified circumstances such offender will be disfranchised for ten years. The former poll-tax is changed to a registry fee of \$1, and there will be a uniform biennial registration. In the apportionment of school money no distinction is allowed on account of race or color, and no part of such money may be used for any sectarian church or denominational school. The trial of election cases by a jury is abolished, and a bench of judges, appointed by the Governor, is to have sole jurisdiction, without the intervention of either grand or petit jury. The old boards of canvass are superseded by the courts. Divorces can be granted only by the judgment of the court, instead of by the legislature as formerly. Education is now compulsory.

Education.—At the close of the school year 1896-7, there were 14 public high schools; 3 private secondary schools; a public and a private normal school; a State college; and an agricultural and mechanical school connected with the college. Delaware College has now seven courses, the last addition being one in general science. Tuition is now free to all students belonging in the State. The agricultural and mechanical department, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 42 periodicals, of which 6 were dailies, 30 weeklies, and 5 monthlies.

Finances.—On December 31, 1897, the liabilities of the State aggregated \$844,750, and the treasury held assets amounting to \$1,120,816, or \$276,066 in excess of the liabilities. The total assessed valuation was \$77,632,079, a gain of \$3,497,678 in seven years. In January 1898, the total debt was \$769,750, a decrease of \$312,690 since 1890. The new constitution prohibits the State from borrowing money or creating a debt, excepting "to supply casual deficiencies, repel invasion, suppress insurrections, defend the state in war, or pay existing debts." Countries, cities, towns, or other municipalities are prohibited from lending their credit, appropriating money, or aiding in any manner any private person or corporation.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 187,000.

Events of 1898.—Shortly before its adjournment the legislature passed a law nullifying civil service law by practically destroying the Australian ballot system. This the Governor afterwards restored. One of the most sensational incidents in the State was the trial of Senator Kenney for defrauding a bank; the jury disagreed.

Officers.—The Representative to the House is John H. Hoffecker (Rep.), from Smyrna, whose plurality was 2,510; the Senators are Richard R. Kenney (Dem.), from Dover; and a Republican.

The officials at the beginning of 1899 were: E. W. Tunnell (Dem.), Governor; J. H. Hughes (Dem.), Secretary; L. H. Ball (Rep.), Treasurer; Edward Fowler (Dem.), Commissioner of Insurance; Robert P. White (Dem.), Attorney-General; J. A. Lingo (Rep.), Auditor; and Garrett T. Hart (Dem.), Adjutant-General. Chief Justice, Charles Lore (Dem.); Associates, Ignatius C. Grubb (Dem.), W. C. Spruance (Rep.), James Penniweil (Rep.), William H. Boyce (Dem.), and Clerk, W. S. Hutson (Dem.). There are 21 Democrats and 31 Republicans in the State legislature.

DELOS. See ARCHÆOLOGY (paragraph Greece).

DELPHI. See ARCHÆOLOGY (paragraph Greece).

DELUGE, BABYLONIAN ACCOUNT OF. See ARCHÆOLOGY (paragraph Babylonia).

DEMANGE, EDGAR, the counsel for Dreyfus (see FRANCE) in his trial before the secret court martial. He undertook the case only after convincing himself that his client was innocent, and he is said to have remarked that he was perfectly sure that had the trial been public, Dreyfus would not have been condemned. His services were heartily appreciated by the accused, who wrote to him that he felt sure that an innocent man could not be forever condemned. Demange criticized severely the action of the court in proceeding with the Esterhazy trial with closed doors, attributing to it the prolongation of the popular excitement. He caused a great sensation by stating publicly in court that the decision of the court martial was illegal, since the judges had evidence which was not communicated to the accused, and again on July 9, 1898—two days after M. Cavaignac's speech in the Chamber—M. Demange wrote that the documents cited by the Minister of War and used against Dreyfus in his trial, had never been shown to the prisoner or to his counsel.

DENDERAH, EGYPT. See ARCHÆOLOGY.

DENMARK is the smallest of the three Scandinavian states, having an area, including the Farøe Islands, and the islands of the Baltic sea, of 52,289 sq. m. and a population exclusive of the colonies, estimated in 1897 at 2,256,000. The area of the crown dependency of Iceland, and the colonies of Greenland and the West Indies is 86,614 square miles, with a population in 1890 of 114,229. About 80 per cent. of the soil of Denmark is productive. The land is divided into small holdings, and the system of tenure is largely peasant proprietorship. The importance of agriculture is increasing and recent statistics show a more extensive foreign demand for native agricultural products. Nevertheless, Denmark does not raise sufficient cereals for home consumption and imports a much larger quantity than she exports. The principal crops raised are oats, barley, rye, wheat, potatoes and other vegetables. Dairy-farming is one of the chief occupations, the export of dairy products being an important source of wealth. Mineral resources are not extensive, but coal, gypsum and salt are found. The lack of a sufficient supply of coal has retarded the development of manufactures.

Exports and Imports.—The chief exports are pork, butter, eggs, lard, and colonial goods. The exportation of dairy products has recently increased to an enormous extent. As to the distribution of the export trade, the leading nations to which Danish exports were sent in 1896 were, in the order of their importance, Great Britain, Germany, Sweden and Norway, Russia, the Danish Colonies, France, and the United States, and of these Great Britain's share was by far the largest. In that year the leading nations in respect to imports into Denmark were in the order of their importance, Germany, Great Britain, Sweden and Norway, Russia, United States, Holland, France and Belgium. In 1896 Denmark exported to Great Britain goods to the value of 169,684,000 kroner, and imported from Great Britain goods to the value of 78,264,000 kroner, both showing an increase over the previous year. In the same year the value of the exports to Germany was 57,842,000 kroner, and of the imports 126,077,000 kroner. During the year ending June 30, 1898, Denmark exported to the United States goods to the value of \$211,837 and imported from the United States goods to the value of \$12,697,421. As an illustration of the vast increase in the exportation of butter, it may be stated that Denmark's exports of butter to Great Britain rose from £767,190 in 1870, to £6,288,413 in 1896. There is regular steamship service to the United States, steamers running from Copenhagen to New Orleans and, since December, 1897, from Copenhagen to Newport News and Norfolk. It was announced in March, 1898, that more complete communications would be afforded by different vessels and that efforts would be made to promote the interchange of articles of commerce.

Revenues and Expenditures.—The revenue for 1897 was 65,235,336 kroner, and the expenditures 65,235,594 kroner, the value of the krone, or crown, being in United

States currency 26.8 cents. The estimated revenue and expenditures for 1897-98 were 66,847,101 and 64,734,189 kroner respectively; for 1898-99, 68,568,724, and 68,430,032 kroner respectively; and for 1899-1900, 68,200,000 and 68,000,000 kroner respectively. The estimate of the budget for 1898-9 showed the chief sources of revenue to be, indirect taxes, direct taxes, and the interest on the state assets. A considerable income each year is derived from the State Lottery. In the same estimate the largest item of expenditure was for the improvement of state property and reduction of the debt, and the next item of importance was the Ministry of War. Between 1880 and 1895 the debt increased, but since that it has been reduced, being in 1898, £11,579,335.

Army and Navy.—All able-bodied men who have reached the age of twenty-two are liable to military service for eight years in the regular army and its reserve, and for eight years in the extra reserve. Important changes have been undertaken since 1894, and it has been estimated that by the year 1910 Denmark will have an effective force of 83,000 men, but according to the figures for 1897 the strength of the army on a peace footing was 751 officers and 10,000 men, and on a war footing, 1,352 officers, and 45,910 men, and, including the Citizens' Corps of Copenhagen and Bornholm Island, the total war strength amounted to about 60,000 men. The Danish fleet is kept up for purposes of coast defence and was represented in 1897 by 3 coast defence armor clads; 11 cruisers of the third class and gun vessels; 5 gun boats, and a flotilla of 24 torpedo boats.

Labor Interests.—A law providing compensation for workingmen in case of accident was passed in 1898 but was not to go into operation until January 1, 1899. The injured workingman is to receive three-fifths of his daily earnings beginning at the close of the thirteenth week from the time of the accident and lasting so long as the disablement is complete. If the disablement be permanent a sum equal to six times his yearly wages is granted to him and in case of death the burial expenses are paid and the family receives four times the yearly wages of the deceased.

Political Parties and History.—Danish political parties are divided on the question of the supremacy of the Lower House of Parliament. The Conservative party, or Right, hold that the constitution does not give to the Lower House, or Folkething, the control in matters of finance and taxation or the right to decide who shall be the ministers. These powers and rights are claimed for the Folkething, by the other party known as the Left, which, however, is divided into two groups, the Radicals and the Moderates. The Left favors the English parliamentary system and maintains that the Folkething may not be overruled by the Landsting, or Upper House, and the King. For years the majority in the Folkething has been fighting the Upper House on this issue. After the election of 1892 the Moderate Left held 43 seats, the Radical Left 28, and the Right 30 seats in the Folkething. This was a falling off for the Radical Left, which in the previous election had secured 39 seats. It was now agreed that a compromise should be established, the majority promising to confirm the provisional laws which had been enacted by the ministry and the ministry promising to resign. This agreement was carried out and the Estrup ministry retired after holding office for nineteen years (August 7, 1894). The new Premier, Baron de Reedtz-Thott, made overtures to the Radical party. A series of somewhat democratic measures were introduced and there was a gradual leaning toward the Agrarian element in the Folkething. The result of this was to offend the Conservatives and at the same time it did not insure Radical and Socialistic support because the measures of the government did not go far enough in the desired direction. In the meanwhile in 1895 the Radicals had gained a large number of seats and the Conservative minority was further reduced. In 1897 a conflict arose with the ministry over an item of the budget which was objectionable to some of the Radicals and Socialists. The Conservatives remained inactive hoping that the Radicals would overthrow the ministry, but a compromise was reached in regard to the budget and the Radicals continued to support the Premier. The Conservatives now steadily opposed the government and in the spring of 1897 the Premier retired. The new minister was M. Hoerring whose affiliations with the Agrarian element were not so marked as those of the previous Premier. The elections of April, 1898, showed further gains for the Radicals and losses for the Conservatives. The returns gave 63 Radicals, 23 Moderates, 12 Socialists, and 15 Conservatives. Thus the Radicals had an absolute majority over all others in the Folkething. But the Hoerring ministry did not resign, continuing to rely for its support on the Landsting. To that body the elections of September, 1898, returned 43 Conservatives and 23 members of the opposition.

Among the other important events of the year 1898, were the festivities in commemoration of the events of 1848; the meeting of the Socialists' congress at Odensee on August 4; and the death of Queen Louise of Denmark on September 29, followed by her interment in the Roskilde Cathedral on October 15, the funeral being attended by a number of royal personages including the Czar of Russia, the King of Sweden, and the King of Greece.

DENSITY OF EARTH. See PHYSICS (paragraph Gravitation Constant, etc.).

DERMATOLOGICAL ASSOCIATION, AMERICAN, organized in 1876, to promote the study of dermatology. Membership restricted to regular graduates in medicine who have practiced 5 years in the specialty in the United States or in Canada. Next annual meeting in Philadelphia, Pa., in June, 1899. President, J. K. Fordyce, M. D.; Secretary, Geo. T. Jackson, M. D., 14 E. 31st st., New York City.

DEROULEDE, PAUL, a French poet and politician, born September 2, 1848, was prominent in the year 1898 for his violence as a member of the Anti-Dreyfusards. He was the organizer and chief of the "League of Patriots," being for the second time elected president of that body in 1895. He attacked in a furious speech the prime minister Brisson for his favorable attitude toward the revision and he was foremost in the hue and cry raised against the Jews and against Zola. See FRANCE (paragraphs on History). Among his recent writings may be mentioned: *Chants du paysan* (1894); *Messire du Guesclin* (1895); *Poésies Militaires* (1896); and *La mort de Hoche* (1897).

DESART, WILLIAM ULICK O'CONNOR CUFFE, Fourth Earl of, died September 15, 1898. He was born in London July 10, 1845; was educated at Eton and Bonn; became page of honour to the Queen, and in 1862 lieutenant in the Grenadier Guards and in 1865 captain. He was the author of many novels, among which are: *Kelverdale*; *Lord and Lady Picadilly*; *Children of Nature*; *Love and Pride on an Iceberg*; *Helen's Vow*; *The Raid of the "Detrimental"* (1897).

DESCHANEL, PAUL, was reelected permanent president of the French Chamber of Deputies in June, 1898. He was born in Brussels in 1857, his father being an exile from France at that time. He was educated at Sainte Barbe and afterwards at the Lycée Condorcet and in 1876 became secretary to the Minister of the Interior. After holding several minor offices he stood for a seat in the Chamber of Deputies but was defeated (1881). Four years later he was elected as a Moderate Republican. At the close of 1891 he visited the United States as a commissioner of France to study the labor problem in this country, and with this object in view conferred with the prominent representatives of labor and investigated the different systems of trades unions. After about two months spent in traveling throughout the country he returned to France, having stated as his general impression that the American laboring classes were better paid, better fed and as a rule more contented with their lot than those in France. In the Chamber of Deputies his career has been marked by conservatism. His oratory is said to be of a high order and his speeches on financial questions especially effective.

DEVELOPMENT OF THE EMBRYO. Of all the advances made during 1898 in our knowledge of embryonic development, that made in Reptilian embryology through the investigations of Professor Dendy on the New Zealand Tuatua Lizard (*Sphenodon*) is undoubtedly the most important. This interesting animal, the only living representative of its order and regarded as the oldest existing type of reptile, is now found only on Stephen's Island off the coast of New Zealand, where it is at present protected by the government. By special permission, Professor Dendy secured the eggs, the collecting of which is forbidden by law. They are laid in November, but do not hatch for 13 months, the embryos passing the winter in a state of hibernation. In this respect they resemble the embryos of some turtles, which have heretofore been considered the only vertebrate embryos having this peculiarity. Before hibernation the nostrils of the embryo become plugged up with a growth of cellular tissue. The early stages of development are strikingly like the corresponding stages in the turtle, and this is especially true of the membranes that surround the young animal. The posterior amniotic canal, leading to the exterior behind the embryo and previously known only in turtles, is present. These facts seem to confirm, at least in part, the views of certain zoölogists that this curious reptile is as nearly related to the turtles as it is to the lizards. In the later stages of development, the young animal has a strongly developed pattern of longitudinal and transverse stripes, which disappears before hatching, the adult being usually spotted. This is an interesting confirmation of the law of coloration which has been observed to prevail among many mammals and birds, that a striped condition usually precedes a spotted or plain coloration.

It is interesting to consider that as in 1898 the most important advance in our knowledge of development comes from the antipodes, so in the preceding year the most important contribution to embryology was by Professor Hill of Australia, showing the presence of a placenta in the Marsupial, *Perameles*. That these most important discoveries and additions to our knowledge should come from workers geographically so far away is an interesting commentary on the advances made in our knowledge of the development of animals since Professor Agassiz gave his famous lectures on *Comparative Embryology*.

The development of representatives of all the important groups of animals has now been worked out so thoroughly that the relationship of the parts to each other and

the likenesses between the embryos of different animals are much more clearly understood than ever before. During the past five or six years the science of "Developmental Mechanics" has been recognized and many investigators are engaged with its problems. It is now well known that the form which the earliest stages of development take depends largely on the amount of yolk in the egg; those in which the amount of yolk is comparatively small dividing completely in the first stages, while those with a great deal of yolk divide only superficially. The three layers of the embryo, now known as *ectoderm*, *mesoderm* and *endoderm*, arise differently in different groups of animals and their origin and ultimate fate forms one of the fascinating problems of embryology. As a rule we can say the ectoderm gives rise to the body-covering and nervous system, and the mesoderm to muscles, and the circulatory system and internal skeleton when these are present. The endoderm, from which the greater part of the alimentary canal is formed, usually arises as an invagination of certain larger cells at one pole of the dividing egg, and as these cells become completely covered by the more numerous small cells of the other pole, which form the ectoderm, there is a small opening or pore left at one end of the embryo, known as the *blastopore*. In eggs of fishes, reptiles, birds, etc., the large amount of yolk prevents the enclosing of the endoderm cells by the ectoderm and accordingly no true blastopore is formed. But it is not unlikely that the *primitive streak* (Agassiz's "primitive stripe") or at least one end of it, represents all that remains of the original blastopore. At any rate it subsequently disappears and does not give rise, as was once supposed, to the *chorda dorsalis* (notochord) nor do its edges unite to form "a closed canal which is soon filled with a fluid from which the brain and spinal cord are subsequently developed." The notochord arises some time after the primitive streak has disappeared, as a thickening on the dorsal side of the primitive gut and is therefore derived from the endoderm. The brain and spinal cord are formed from a furrow in the ectoderm, in front of the primitive streak, which gradually sinks into the mesoderm and becomes a hollow tube of ectoderm entirely cut off from the exterior. Its anterior end subsequently enlarges and gives rise to the brain, the first appearance of which is in the divisions of swellings, but these do *not* "correspond to the organs of sight, hearing and smell." The most anterior of them subsequently gives rise to the cerebrum and the optic thalami, the middle one gives rise to the optic lobes, and from the posterior arise the cerebellum and medulla oblongata. During their early stages the embryos of vertebrates resemble each other closely but the differences between them are yet so well marked that the class or even the order to which they belong can be determined very early in life. Unfortunately space does not permit us to go further into the problems of development or to discuss any more of the advances made in our knowledge during the past year.

DEWEY, GEORGE, Rear-Admiral, U. S. N., who was brought into especial prominence by his brilliant victory in Manila bay on May 1, 1898, and who was popularly held as the first hero of the Spanish-American War, was by no means unknown before the battle of Manila, for he had a most honorable record, having fought with great bravery under Admiral Farragut in the Civil War, and having occupied various positions of rank and responsibility since that time. Admiral Dewey is of old English stock and was born in Montpelier, Vermont, December 26, 1837. His father Doctor Julius Dewey was a man of great strength of character, kindly and religious. The admiral seems to have inherited many of his strong points from this man of whom he has said, "Of all the public men I have met in my experiences in the world, my father stands first in character."

In 1825 Julius Dewey married Miss Mary Perrin. Four children were born, Charles, Edward, George, and Mary. As a boy George showed a great love for outdoor sports and activity of every kind. At fifteen he entered the Norwich Military Academy, at Norwich, Vermont, and two years later the Naval Academy at Annapolis as a member of the class of '58. The class entered with sixty-five, fourteen of whom received diplomas, Dewey ranking fifth. Two years later he returned to be examined for a commission; his standing gained at this time, together with his mark at graduation, gave him three as a final class rating. When Fort Sumter was fired on, Dewey was ordered to serve as first lieutenant on the *Mississippi* of the West Gulf squadron, which fleet in February 1862, came under the command of Admiral Farragut. In April the larger vessels, among them the *Mississippi*, passed up the river with the purpose of running the batteries of St. Philip and Jackson and engaging the Confederate fleet which lay below New Orleans. The undertaking was hazardous, but in the terrific cannonading that ensued young Dewey bore himself with the utmost calmness and bravery. The next year when the *Mississippi* was stranded and lost on the Port Hudson shoals, though the shots were flying so thick that the boat was struck two hundred and fifty times in half an hour, Lieutenant Dewey, on whom devolved the task of getting the men off in safety, again conducted himself with that firmness and ability which has always been characteristic of the man. Years afterward Admiral Farragut said to the old Doctor, the lieutenant's



ADMIRAL GEORGE DEWEY.

father, "Sir, your son George is a worthy and brave officer. He has an honorable record and some day will make his own mark." In December, 1864, and January, 1865, Lieutenant Dewey served with distinction at Fort Fisher on the *Colorado*, under Commodore Thatcher and Admiral Porter. Two months later he was made a lieutenant-commander. During the first two years after the war he served with the European squadron; in 1868 he was attached to the Naval Academy, and two years later received his first command. In 1875 he was made commander. After serving on the Light-house Board and as commander of the *Juniata* in the Asiatic squadron, he was advanced in 1884 to the rank of captain, having in command the *Dolphin*, of the "White Squadron," and the next year he was transferred to the *Pensacola*, the flagship of the European squadron. After 1888 he served in several responsible positions on shore, and when he was made commodore became the chief of the Board of Inspection and Survey. At the beginning of 1898 he was ordered to sea again, taking in command the Asiatic squadron, which was destined to have such an important part in the Spanish-American War. Upon receiving the report of the battle of Manila, President McKinley immediately made Commodore Dewey an acting rear-admiral, and Congress unanimously passed a joint resolution of thanks, and a bill increasing by one the number of rear-admirals, so that Commodore Dewey might receive immediate promotion.

The admiral was married about 1867 to Miss Susy Goodwin, daughter of the well known "fighting governor" of New Hampshire. His wife died in 1872. He has one son, George Goodwin, born in 1872. See SPANISH-AMERICAN WAR (paragraph Battle of Manila).

DHOUKHOBORTSI, a Russian sect termed by their Orthodox fellow-countrymen, "spirit wrestlers," but claiming for themselves the name of "Universal Brotherhood Christians." Their origin, which dates from the eighteenth century, is obscure, but is attributed by some to Quaker influence. They do not believe in a personal God and in their doctrine of the Trinity they identify the memory, the reason and the will with God the Father, God the Son, and God the Holy Ghost, respectively. They are communists, but, although they do not recognize human authority as binding, they have not shown themselves revolutionary in practice, for generally they have offered no resistance to governmental decrees beyond a persistent refusal to take up arms. With them the family tie is not regarded as binding except in so far as it rests upon mutual affection. The sect has been subjected to persecution for several centuries. In 1799 the Czar issued a decree directing their banishment to Siberia for life and 15,000 of them are said to have been transported in consequence. In 1860 nearly an equal number of these exiles returned to Russia. At last they sought permission to emigrate and obtained it on condition that they should do so within two years and at their own expense. The interest of philanthropic persons in other countries was enlisted by Count Tolstoi, and in England some practical efforts were made on their behalf, resulting in the transplanting of about 1,100 of them as a colony in Cyprus. Recently people in Canada and in the United States have shown an interest in their cause. The Canadian government has consented to the settlement of numbers of them in western Canada. In the United States a committee was formed in 1898 to aid them in emigrating.

DIAMONDS. For the year ending June 30, 1897, 2,769,423 carats, or 1254.3 lbs. avoirdupois, or about $\frac{5}{8}$ of a ton of diamonds were produced by the De Beers Consolidated Mines, Ltd., of South Africa. This required washing of 2,409,030 tons of diamond bearing rock. The following figures apply to the same company and extend to June 30, 1897:

Number of loads (16 cwt.) of blue ground hoisted.....	2,515,889
Number of loads (16 cwt.) of blue ground washed.....	3,011,288
Number of carats of diamonds recovered.....	2,769,423
Amount realized by sale of diamonds.....	£3,722,099 \$18,610,495
Number of carats per load of blue ground.....	0.92
Amount realized per carat sold.....	\$6.45
Amount realized per load....	\$5.93
Cost of production per load	\$1.77
Profit per load	\$4.16

Up to the end of 1897 the total weight of diamonds exported from South Africa exceeded 63,000,000 carats ($12\frac{3}{4}$ tons), valued at about £87,000,000, or \$435,000,000.

A new district has been discovered in the Transvaal, thirty kilometres east of Pretoria, and 480 kilometres from the Kimberley Mines.

Recent experiments tend to show that diamonds may be produced by bringing a fused silicate mineral in contact with carbon, and as the African diamonds are found in igneous rocks, which cut carbonaceous shale, they may have been formed in this way.

DIARRHŒA. See PUBLIC HEALTH.

DIET AND FOOD. Haig, of London, has published a small brochure during the year, in which he treats of the physiology of albumen and urea, in the line of his first work on uric acid in the causation of disease. He considers the ignorance of people in regard to the relative value and importance of foods as accountable for much disease. He alludes to the error of carrying the diet of youth into middle life, or the diet for an active, out-door life into a life of sedentary office work. The first essential of nutrition is the supply to the blood of albumen, sufficient in quantity to replace that transformed into urea in the production of force. Exercise increases the production of urea. With the fall in the quantity of urea there is a corresponding diminution of strength and power of endurance, that is, of force production. The excretion of urea is the measure of the force available; its falls and rises accurately register the conditions of the nutrition, strength and endurance of the body. Haig has tested on himself and others the urea-producing power of milk, cheese and sugar, finding that the earliest results came from milk, the slowest from sugar, and that the rise in urea from sugar was due to the rise of acidity preceding it. Sugar owes its bad reputation as a producer of gout, Haig says, to its effects on acidity and the solubility of uric acid. If uric acid supplies are kept low, and the supply of fresh vegetables and fruits is good, sugar can do no harm. The trouble with it has arisen from associating it with animal flesh. Ingestion of dilute acetic acid caused a rise in acidity and in urea, because it clears the blood of uric acid which probably in colloidal form is obstructing the peripheral capillary circulation and preventing both the ready access of the blood albumens to the tissues and the removal of waste products from these. Fatigue Haig considers due to a general dearth of albumens in the blood and a condition in the blood which leads to its defective circulation through the tissues, so that though the blood contains albumens the tissues cannot readily extract them, and also the tissues become laden with waste products. Meat-eaters, who also use tea, coffee, tobacco and stimulants suffer early from fatigue; while those who get their albumens from milk, cheese and vegetables, and use lemons, show great endurance. The latter class suffer, also, less shock after injury, with less liability to fatal results. The available foods, free from uric acid, are the following: (1) Milk and milk products, as cheese. (2) The pulses, as peas, beans, lentils and dhol. (3) Bread stuffs, cereal foods and glutens. (4) Nuts and nut foods. (5) Garden vegetables, as potatoes. (6) Garden fruits, as apples. (7) Dried and foreign fruits. For a man weighing 140 lbs. Haig proposes a daily allowance as follows:

10 oz. of bread, 8 per cent. of albumens.....	340 grains
2 oz of oatmeal, 12 per cent. of albumens.....	104 grains
2 pints of milk, 3 per cent. of albumens.....	525 grains
2 oz. of cheese, 33 per cent. of albumens.....	281 grains
1 oz. of pulses, 22 per cent. of albumens.....	94 grains
Fruits, nuts and vegetables, about ½ to 2 per cent. albumens.....	126 grains

Total, 1,470 grs. of albumens daily, which will produce 490 grs. of urea per day when completely digested and metabolized. See SUGAR AS A FOOD.

DINGLEY, NELSON, Jr., member of the national House of Representatives from the second district of Maine, leader of the Republicans, and chairman of the ways and means committee, was appointed a member of the Anglo-American Joint High Commission, which was created in May, 1898. He was born at Durham, Androscoggin county, Maine, February 15, 1832; entered Waterville College (now Colby University) in 1851, but was graduated from Dartmouth in 1855. Though admitted to the bar he did not practice law, but in 1856 became editor and proprietor of the *Lewiston Journal*, a weekly, which in 1861 became a daily. This paper, with which he always maintained some connection, has been constant in its support of Republican principles. Mr. Dingley was a member of the State House of Representatives in 1862-65, 1868, and 1873, being speaker 1863-64; he was Governor of Maine for the two terms 1874 and 1875 and declined renomination; and in 1876 was a delegate to the national Republican convention. On September 12, 1881, he was chosen at a special election to fill the vacancy in the Forty-Seventh Congress made by the election of William P. Frye to the United States Senate; he was reelected as representative at large to the next Congress, and was returned successively to the Forty-Ninth—Fifty-Fifth Congresses. Since his first speech in Congress, which was on the subject of protection to American shipping, he has favored legislation for the development of American shipping and fisheries. He aided in the preparation of the McKinley tariff law of 1890, opposed the Wilson law of 1894, and framed the present tariff schedule which became a law in 1897. It was upon his initiative that the Bureau of Navigation in the Treasury Department was organized. In 1874 he received the degree of LL. D. from Bates College, and in 1894 from Dartmouth. Mr. Dingley was always popular with his constituents and his party

and was recognized by all as an able and conscientious member of Congress. On June 11, 1857, he was married to Miss Salome McKenny. They had six children, of whom five are living.

DIPHTHERIA. The control of diphtheria, which has been epidemic in this country since 1857, is largely due to the early treatment of the disease with antitoxin, together with systematic isolation of cases. While occasional clinicians of experience and ability are found who actively antagonize the theory of and deny the good results claimed for the use of antitoxin, the great and overwhelming mass of evidence in its favor continues to increase year by year. The diphtheria committee of the Clinical Society of London in its report for 1898 publishes the following results of inquiry into 633 genuine cases of diphtheria: The total mortality in these cases was 19.5 per cent., as opposed to 29.6 per cent. in the non-antitoxin control series, compiled before the introduction of antitoxin. In the tracheotomy cases the mortality amounted to 36 per cent., as opposed to 71.6 per cent. in the non-antitoxin series. Buchwald, of Munich, reports 57.72 per cent. of deaths in cases treated without antitoxin, 28.93 per cent. of those treated with antitoxin. Krönlein, of Zürich, reported to the Congress of German Surgeons in April, 1898, upon 1,773 cases of diphtheria observed in the clinical hospitals of the University from 1881 to 1897. The mortality in the pre-antitoxin period was 39.9 per cent. as against 12.5 per cent. in the antitoxin period. In the operation cases (including both tracheotomy and intubation cases), the mortality was 66.1 per cent. under the old régime, and 35.6 per cent. with antitoxin. In the cases not operated upon the mortality in the pre-antitoxin period was 14.2 per cent. against 5.6 per cent. under antitoxin. In all the 437 cases occurring in the antitoxin period the Klebs-Löffler bacillus was demonstrated. A. Jacobi, of New York, (*Twentieth Century Practice*), sums up the facts proved by Krönlein's statistics as follows: While the morbidity of the whole district (city and country) remained unaltered in the antitoxin period, the mortality decreased considerably, and principally in the first years of life. While previously to the institution of the antitoxin treatment one-half of all the cases demanded operation, this percentage had fallen to 23.1 per cent. since that time. H. M. Biggs, of New York, concludes from extensive experience and many researches made as pathologist for the Health Department, that since the introduction of antitoxin treatment the mortality of diphtheria is reduced to one-half, its course is shorter and milder; an injection made within the first two days reduces the mortality to 5 per cent.; the earlier it is made the better the result. Small quantities of concentrated serum are tolerated by the very youngest babies. If antitoxin is not a specific it is certainly the best remedy in our possession against diphtheria. The genuine (that is, uncomplicated bacillary) cases are more amenable to its favorable influence than mixed infections. It has no secondary effects on heart, kidneys or nerves. Heart failure and paralysis whenever observed are caused by diphtheria not by antitoxin.

Klebs reported in 1883 his discovery of the bacillus which causes diphtheria, and in the succeeding year Löffler published the results of extensive investigations of the subject. Roux and Yersin added proof to the dependence of diphtheria on this bacillus, and the names of the first discoveries have been given to the causative micro-organism. The Klebs-Löffler bacillus is an aërobe, non-motile and non-liquefying, and does not form spores. It occurs in the form of rods, straight or slightly curved, generally swollen at the ends, or swollen in the middle portion and pointed at the ends, found singly or in pairs, and very infrequently in chains of three or four. The diphtheria toxin has been isolated by Roux, Yersin, Brieger, Fraenkel and others, by filtration through porous porcelain from cultures of the living bacilli. While it has not yet been successfully analyzed, it appears to be analogous to the poisons of certain venomous serpents. Fraenkel, Behring, Wernicke, Aronson, Roux and others have succeeded in rendering animals immune to diphtheria by the use of inoculations of virulent or somewhat attenuated cultures or of diphtheria toxin. W. H. Park, of New York, says: "The most important and valuable results are those which have been obtained by Behring, in conjunction with others, who showed that the blood of immune animals contains a substance which neutralizes the diphtheria toxin. The blood-serum of persons who have recovered from diphtheria has also been found to possess this protective property, which it acquires about a week after the beginning of the disease, and loses again in a few months." To obtain antitoxin for therapeutic purposes, strong toxin obtained from virulent cultures of the Klebs-Löffler bacillus are injected into young and healthy horses. At the end of two months, during which time increasing doses of the toxin have been given, blood is drawn from the horses and tested for antitoxin. Those having sufficiently strong antitoxin are retained and the process of inoculating and of withdrawing serum is repeated for years, allowing 3 months each year as an interval of freedom from inoculations. The serum obtained is sterilized by the addition of carbolic acid by some who prepare it, but Park considers the addition of any antiseptic as not only unnecessary but probably inadvisable. The antitoxic serum is used hypodermically as

early as a diagnosis of diphtheria has been made, in dosage of from 600 to 2,000 units. A unit is equivalent to 1 c. c. of "normal serum." Normal serum is the blood serum of an immunized animal which was made so efficacious that 0. 1 c. c. antagonizes ten times the minimum of diphtheria poison fatal to a guinea pig, weighing 300 gm., or about 10 ounces (Jacobi). In the preparation of this article free use has been made of the essays in *Twentieth Century Practice*, Wm. Wood & Co. See PUBLIC HEALTH and SERUM THERAPY.

DISCIPLES OF CHRIST, a division of Baptists, also known as the Campbellites, and as the Church of Christ. They are composed principally of rural people, but they are now increasing in the cities. There are (1898), 5,922 ministers, 10,088 churches, and 1,085,615 members. In 1898 they had 42 State and district missionary societies, and they inaugurated a system of city evangelization and collected and expended \$506,454 in missionary work at home and abroad. The three missionary societies of the church, the American Christian Missionary Society, the Christian Woman's Board of Missions, and the Foreign Christian Missionary Society supported mission workers in the West Indies, India, and in Mexico, besides in the United States. This denomination has 646 Christian Endeavor societies.

DISEASES OF PLANTS. See BOTANY.

DISESTABLISHMENT. See ENGLAND, CHURCH OF.

DISINFECTION. See FORMALDEHYDE.

DISPENSARY ABUSE. The want of unanimity among physicians in limiting the dispensary abuse still exists and the abuse increases. In all the large cities where medical colleges exist the number of well-to-do people who seek free medical aid increases. The blame appears to lie at the doors of the trustees and superintendents of the clinics and of the physicians who practice in the clinics. The college clinic is established for the purpose of securing material with which to illustrate the didactic lectures delivered by the professors, and with which to teach medical students appearances and conditions of disease. To give free medical advice to the poor is generally a secondary consideration. The applicant for free treatment at a college clinic, or at a dispensary where the attending physician is allowed to teach private paying pupils with the illustrative aid of the patients, is quite as often admitted in silence as he is questioned about his ability to pay a fair fee to a physician practising near his home. If the question is asked him, he is not always truthful. It is a matter of common occurrence for patients to wear old clothing and give fictitious names and false addresses, in order to save paying a physician the fees they are abundantly able to afford. Patients will spend in railroad fares from adjacent or even distant towns the money they will not pay to their physicians at home, and then ask free treatment at the hands of one whom they think more famous or more competent. Some patients have been known to drive in cabs to dispensaries and ask gratuitous aid. Others proffer a banknote of considerable size to pay the small fee (generally ten cents) charged for medicines. When the Vanderbilt Clinic of the College of Physicians and Surgeons, medical department of Columbia University, in New York City, was first opened, all cases applying for treatment were investigated by the Charity Organization Society of that city. The Society discovered that about one-third of the cases were undeserving. Carelessness in investigating the status of people applying, a desire to show large numbers at the end of the year, the hope of attracting a disproportionately great number of unusual or rare cases of disease and an attempt to secure a large share of the charitable funds of the community—the share being proportionate to the work done—combine to create, foster and increase the dispensary abuse. The latest available statistics in New York State, in which the dispensary abuse probably flourishes most extensively are those collected by the State Board of Charities, and are limited to the seven largest cities in that State. They are as follows for the year 1897:

	Number of Patients.	Per Cent. of Population.	Number of Prescriptions.
New York.....	1,077,140	71	1,699,468
Brooklyn.....	252,695	31.3	455,940
Buffalo.....	14,886	5.8	32,509
Rochester	2,476	1.8	6,698
Albany.....	20,345	21.4	17,939
Syracuse.....	8,796	9.9	6,116
Troy.....	715	1.2	716

The figures apparently showing the percentage of population are misleading, because many patients come from a distance to be treated at the free dispensaries of all

large cities. Patients have come, for example, to make application at the Vanderbilt Clinic, in New York City, from towns on Long Island, in the Hudson River Valley, in New Jersey, in Connecticut and even in Vermont.

The physicians who serve in the clinics and dispensaries receive no salaries and no fees of any kind. Their return comes, if it comes at all, from the clinical experience afforded and the prestige attached to membership in the medical staff of a perhaps famous institution. Their colleagues, to whose offices the well-to-do patients ought to go, are defrauded out of their natural income, and these patients are demoralized and allowed to take the first step toward pauperization. Of late years some bill calculated to control the dispensary abuse has been introduced annually into the State Legislature as soon as the annual meeting has occurred. Most of the bills die in committee. In March, 1898, the New York State Senate Committee on Public Health reported favorably a dispensary bill for New York City, after a long and stormy argument. Dr. E. Eliot Harris, of New York, thus sums up the salient features of this bill:

"This bill is designed to restore to the poor people an absolute monopoly of what belongs to them alone by virtue of the prime purpose for which all dispensaries are designed, and prevent any further encroachment upon the rights of the poor by those who have no right so to encroach. Every dispensary is supported by private donations and bequests, or by public appropriations, or by both, solely for the benefit of the poor, and the use of those institutions by any but the poor is an abuse of medical charity, and a fraud upon the institution, or else a misapplication by the institution of private funds held in trust by it for a specific purpose, or public funds appropriated for a specific purpose, or both. This bill is designed to relieve the poor of the annoyance and inconvenience constantly complained of, they being compelled to wait in these dispensaries until well-to-do patrons are cared for. If this bill is not passed, you will find that within one decade the charitably disposed, influenced by the present condition of acknowledged misuse of legacies and bequests, will turn their charitable instincts in some other direction. Then what will become of the increased number of poor in the greatly increased population that will then exist? All dispensaries have taxes remitted and participate in the charitable funds of the community in proportion to work done, and their sworn statements to the Board of Charities demonstrate that the charitable work done in the dispensaries of New York City equals 50 per cent. of the population, showing the necessity for State control of the methods of bookkeeping in the matter of the investment of such funds as come into their hands, and the institution of a proper system of registering the cases treated. The bill provides that rules and regulations which will include a system of bookkeeping, and the registering of all cases treated shall be made by the State Board of Charities." The bill did not become a law.

DISPERSION FORMULA. See PHYSICS (paragraph Interpolation Formula for Prismatic Spectrum).

DISTILLING SHIPS to produce fresh water for the boilers of the United States naval vessels engaged in blockading the Cuban ports during the war with Spain, and at Manila, were found to be necessary, and two vessels were purchased by the government and equipped for this work. These were the *Iris* and *Rainbow*. Both were iron vessels about 310 feet long, 38½ feet beam, and 27 feet depth of hold, with speeds of from 10 to 12 knots, and capacity of about 2,500 tons. The *Iris* was equipped with a form of boiler known as an evaporator, the total capacity of the 12 evaporators being 60,000 gallons per day, or two pounds of fresh water per pound of coal burned. In the fore part of the vessel were 17 large storage tanks, capable of holding 83,000 gallons of fresh water, and in the rear were 16 similar tanks with a capacity of 95,000 gallons, or a total of 178,000 gallons. The process is to pump sea water into the evaporators, where it is heated and slowly turned into steam. It then passes to the condenser and is turned into water. From the condensers it flows to the storage tanks. The cost of fresh water obtained in this way averaged about 18 cents per ton, against 70 cents per ton for fresh water conveyed in lighters and tank boats.

DISTRIBUTION OF ANIMALS. Our knowledge of animal distribution has been increased along many different lines during the year 1898, but the most important contribution to that knowledge has undoubtedly been the publication of Mr. J. E. S. Moore's investigations into the fauna of the great Central African lakes, particularly Tanganyika. Although Mr. Moore set out in 1895, it is only during the past year that the material collected has been worked over, and the results have proven interesting beyond expectation. The discovery of jelly-fish in Tanganyika some years ago was an indication of a peculiar fauna in that lake, resembling in some particulars the fauna of the ocean. Mr. Moore's collections show beyond question that such a fauna not only exists but is quite extensive, and he has designated it as "*halolimnic*." To quote his own words: "The fauna of Lake Tanganyika is to

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 296,000.

DOBSON, WILLIAM CHARLES THOMAS, well known English painter, died January 30, 1898. He was born at Hamburg, Germany, December 8, 1817; educated at the Royal Academy, London; became an A. R. A. in 1860, an R. A. in 1872, and a member of the Royal Society of Painters in Water Colours in 1882. A great number of his pictures have been engraved.

DOCKERY, General THOMAS, died in New York City February 26, 1898. He will be remembered for organizing and leading a Confederate detachment in the Civil War. He was born at Bowling Green, Kentucky, in 1828.

DODGSON, Rev. Dr. CHARLES LUTWIDGE, M. A., mathematician and humorist, died at Guilford, England, January 14, 1898. He was born in 1832. Having graduated at Christ Church, Oxford, with an excellent record, he was ordained in 1861 and for the next twenty years was mathematical lecturer at his *alma mater*. His first publication was *A Syllabus of Plane Algebraical Geometry* (1860); this was followed by *The Formulae of Plane Trigonometry* (1861) and *A Guide to the Mathematical Student in Reading, Reviewing, and Writing Examples* (1864). In 1865 appeared, over the pen name "Lewis Carroll," the book that more than any other made him famous—*Alice in Wonderland*. This book, full of fantasy and whimsical humor, a classic, a delight not only to children but to men and women, was written, it is said, for Alice, daughter of the late Very Reverend Henry George Liddell, sometime Dean of Christ Church. It is difficult for people to believe that the lecturer on mathematics was the author of this quaint and unique work. The approbation with which it was hailed has scarcely diminished in the thirty-five years that have passed since its appearance. The story is told that the Queen on reading it was so pleased that she ordered that Mr. Dodgson's next work be sent to Windsor; Mr. Dodgson obeyed and the Queen received *An Elementary Treatise on Determinants* (1867). Among his subsequent writings are the following: *Phantasmagoria and Other Poems* (1869), *Songs from "Alice's Adventures in Wonderland"* (1870), *Through the Looking-Glass and What Alice Found There*, and *Facts, Figures and Fancies Relating to the Hebdomadal Council* (1871), *Euclid, Book V., Proved Algebraically* (1874), *The Hunting of the Snark, an Agony in Eight Fits* (1876), *Doublets, a Word Puzzle* (1879), *Rhyme? and Reason?* (1883), *A Tangled Tale* (1885), *Alice's Adventures Underground* (1886), *The Game of Logic* (1887), *Curiosa Mathematica, Part I.—A New Theory of Parallels* (1888), *Symbolic Logic* (1896).

It is said that in his latter days he expressed a fear that the excellence of his mathematical labors, which he considered his real life-work, would be obscured by his books of grotesque humor. This will probably be the case, but doubtless the world has received and will continue to receive greater benefit from Lewis Carroll's whimsical fancies than from his learned demonstrations. It was written of him at the time of his death,—“The world will remain convinced that, beneath the pseudonym which has long seemed a real name, there was the soul of a poet of humor, belonging to the great school whose representatives in many ages and countries have been Æsop, Aristophanes, Cervantes, La Fontaine, Goldoni, Molière, Scheffel.”

DOLE, SANFORD BALLARD, jurist, was born in Honolulu, Hawaii, in 1844, his father being an American missionary to the island. After his education in Honolulu and the United States, he was admitted to the Massachusetts bar; he was judge of the Supreme Court of Hawaii from 1887 until the overthrow of the monarchy and the establishment of the provincial government in January 1893. At this time he was chosen Provisional President, and when Hawaii was proclaimed a republic July 4, 1894, Mr. Dole became the first President. In January, 1898, he came to the United States and was welcomed with appropriate honor. It was believed that his mission was to bring about the annexation of Hawaii to the United States. After the resolutions providing for annexation were passed by Congress, President McKinley, on July 8, 1898, made Mr. Dole one of the members of the committee appointed to recommend to Congress suitable legislation for Hawaii. See HAWAIIAN ISLANDS.

DOMINICA, the largest of the Leeward Islands (q. v.), having an area of 291 square miles with a population in 1891 of 27,339. The capital is Roseau, with a population of about 4,500. The chief products are sugar, coffee, spices, lime-juice, cacao, and fruits. The trade of the island having declined, an inquiry was recently made into the causes of the lack of prosperity, and the discontent that was said to prevail there. A change was made in the constitution and the administration of local affairs was placed in the hands of an executive having greater powers than those possessed by the former official. In 1898, the question of accepting financial aid from the imperial government came up for discussion in the legislative assembly. This aid was offered on condition that the crown should have control of the finances. It was at first refused, but later, after the election of the new assembly, was accepted (July 14, 1898).

DONALDSON, Colonel THOMAS C., was born in Columbus, Ohio, 1843; died in Philadelphia, Pennsylvania, November 18, 1898. He served through the Civil War; was register of public lands in Idaho in 1869-75; was a commissioner of the Centennial Exposition, and in 1884 a member of the Republican national committee. He wrote *The Public Domain*, a volume of 2,000 pages, which is the standard reference history of public lands; he was the author of several other books, including *George Catlin's Indian Gallery* and *Walt Whitman, the Man*.

DONGOLA is a province of the Egyptian Soudan with an area, including Khar-toum, estimated at 100,000 sq. m., and a population estimated at 1,000,000. Its capital is New Dongola. It was lost to Egypt in consequence of the Mahdist rebellion, but in 1896 the Anglo-Egyptian expedition under the Sirdar resulted in the restoration of the province to Egyptian rule. See EGYPT.

DORIC TEMPLE. See ARCHÆOLOGY (paragraph Greece).

DOUBLE PERSONALITY. See PSYCHICAL RESEARCH, SOCIETY FOR, also HYPNOTISM (paragraph Crystal-Gazing).

DOUBLE STARS. See ASTRONOMICAL PROGRESS.

DOUMIC, RENE. See FRENCH LITERATURE (paragraph Fiction).

DRAINAGE. See SEWERAGE.

DRAWBRIDGES. See BRIDGES (paragraph Drawbridges).

DREYFUS, ALFRED, the cause of the agitation which has kept France (q. v.) in a tumult throughout the year 1898, was a captain in the 14th Regiment of Artillery, born in Alsace in 1859. At the time of the alleged discovery of his treason he was an officer in the second bureau of the General Staff. It is there that the most important plans affecting army organization and the mobilization of troops are drawn up, and when it was seen that much of this valuable information was communicated to outsiders, suspicion pointed toward Dreyfus. The way in which he was confronted with his accusers was peculiar. On the 14th of October, 1894, he was summoned to the War Office, where he was received by Major du Paty de Clam, in the presence of three witnesses. He was then asked to write a memorandum dictated by du Paty de Clam. This memorandum contained the words of the famous *bordereau*. An arrangement of mirrors in the room made it possible for its occupants to see every gesture and change of expression. As he wrote, Major du Paty de Clam remarked that his hands shook. When the copy was complete the others withdrew from the room, and Dreyfus finding himself alone, noticed a loaded revolver on the table beside him. This of course was interpreted as an invitation to commit suicide. Soon afterwards he was arrested on the charge of high treason, and placed in the Cherche-Midi prison. When the news spread, the public indignation against the supposed traitor rose to a high pitch. He was kept in close confinement, and his counsel, Demange, was not allowed to see him until December 6. On December 19 the court martial began, and the trial was held in secret, and lasted till December 22, resulting in the sentence of military degradation, and transportation for life. On January 4, 1895, he was conducted by a military escort to the courtyard of the Ecole Militaire, and in the presence of a vast crowd which did not cease for a moment to threaten and insult him, the stripes of his uniform were stripped off, and his sword was broken. He was then marched round the courtyard amid cries of "Death to the Traitor." During all this time, notwithstanding threats and cajolery, he protested his innocence, and he continued to protest it and to cry, "Long live France;" in the presence of the angry crowd. On January 19 he was taken to La Rochelle, whence he was shipped to the neighboring Ile de Ré, and on the 10th of March he was transported to the Ile du Diable, off the coast of French Guiana. His wife believed in his innocence from the first. She was the daughter of a wealthy diamond merchant of Paris, and their home was a luxurious one. Upon the arrest of her husband she was threatened by Major du Paty de Clam with all sorts of disasters if she communicated the news to the other members of the family. During the imprisonment of her husband she tried by every means to prove his innocence. She and her husband were permitted by the authorities to carry on a regular correspondence, which, however, was subjected to careful official scrutiny. She worked hard to demonstrate the identity of the hand-writing of the *bordereau* with that of Esterhazy, and she applied twice for a reopening of the case. Her second appeal on September 3, was referred by the Cabinet to the Court of Cassation, when it voted about three weeks later for a revision of the case.

DRIVEN WELLS. See WATER-WORKS.

DRUIDS, UNITED ANCIENT ORDER OF, a fraternal society founded in England in 1781, in America in 1839, has 16 grand groves, 375 sub-groves, and 15,650 members in America. The benefits disbursed since 1847 in this country are \$3,835,248, and in the last fiscal year \$244,669. Peter Schaffrit, St. Louis, is the Supreme Arch;

H. Freudenthal, Albany, Supreme Secretary; and Philip Reichwein, Indianapolis, Supreme Treasurer.

DRUMONT, EDOUARD, the editor of *La Libre Parole* was prominent in the anti-Dreyfus agitation in 1898. He has been one of the most violent of the Anti-Semites in Paris. In the action of the friends of Dreyfus he could see nothing but a desire to support the Jews in their "criminal" policy, and he used the agitation in the Dreyfus affair as a means for stirring up the Anti-Semite feeling. He was born May 3, 1844, in Paris, and has published among other works: *La fin d'un monde* (1886), *La dernière bataille* (1890), *Le testament d'un antisémite* (1891), and *Le secret de Fourmies* (1892).

DRUSES, a people of Syria dwelling on Mt. Lebanon and on Anti-Lebanon to the south of the district occupied by their ancient enemies, the Maronites. They also occupy the district of Hauran. Their number is variously estimated at from 83,000 to 100,000, of whom 50,000 dwell in Hauran. At the close of the year 1895 they revolted against the severe government of the Turks. Hauran was the center of this revolt. The Turks greatly strengthened their troops in that district, but peace having apparently been restored they began to reduce their forces. The banishment of a Druse chieftain in 1896, however, stirred up a fresh revolt in the course of which a Turkish battalion sent out from Suweidah was surprised and cut to pieces by the Druses, and a garrison about 1,000 strong was besieged. The Turks displayed unwonted energy in mobilizing their troops and there was soon an army of 30,000 in the district. In July the Turkish troops gained two victories in the neighborhood of Suweidah, and peace was restored in August.

DUCLAU, M., the head of the Pasteur Institute, came into prominence in connection with the Dreyfus case on account of his efforts to secure revision. He signed the memorial in favor of revision, giving as his reason that whether or not Dreyfus was guilty, it was essential to the cause of public justice that the case should be revised. A fair trial, legally conducted, he thought, was the only way for ending the trouble. He said that France was in a terrible condition if an honorable soldier could be condemned to the worst of all punishments on account of the similarity of his hand-writing to that of a scoundrel. See FRANCE (paragraphs on History).

DUNKARDS, THE, (known also as Tunkers or German Baptists) composed of the German Baptists (Conservative, Old Order, and Progressive) and the German Seventh Day Baptists, had a remarkably prosperous year. The mission work of the church, both home and foreign, especially in India, was satisfactory. The membership in 1898 increased about 5,000.

The total Dunkard denomination comprises 1,116 churches, 2,791 ministers, and 109,194 communicants. Their next National Conference will be held at Roanoke, Va., in May, 1899. The Progressive Brethren held their Conference in Warsaw, Ind. They opened a mission in Dayton, Ohio, paid a part of the debt on Ashland College, Ohio, which was reopened in the autumn of 1898. They have 231 ministers, 160 churches, and 15,000 members. The Old Order Brethren keep no records of any kind and continue their opposition to colleges, high-schools, and Sunday schools.

DUNKIN, EDWIN, F. R. S., F. R. A. S., English astronomer, died November 27, 1898. He was born at Truro, Cornwall, August 19, 1821; was educated privately and in 1838 became a member of the staff of the Royal Observatory, Greenwich, becoming first class assistant in 1856, chief assistant in 1881, and retiring three years later. He was member of council of the Royal Society, 1879-81; president of the Royal Astronomical Society, 1884-86; president of the Royal Institution of Cornwall; 1889-91. Among his published writings are: *On the Probable Error of Transit Observations*, 1860-64; *On the Movement of the Solar System in Space, determined from the Proper Motions of 1,167 Stars*, 1863; *The Midnight Sky: Familiar notes on the Stars and Planets*, 1869; *Obituary Notices of Astronomers*, 1879; *Presidential Addresses*, 1885-86, and 1890-91.

DUPUY, CHARLES, French Premier and Minister of the Interior, succeeding M. Henri Brisson in that position in October 1898, was born at Puy in Auvergne, November 5, 1851. He was educated at the Ecole Normale des Hautes Etudes, and afterward passed many years as a lyceum professor in provincial towns, being for some time a sub-rector in a high school at Ajaccio. His special study has been philosophy. After serving in the Department of Public Instruction he was elected a deputy of the Haute-Loire in 1885, and was re-elected in 1889, 1893, and 1894. In the Ribot cabinet (1892) he was Minister of Public Instruction and in April 1893, was called by President Carnot to become president of the council (Premier) and Minister of the Interior; in December of that year he was elected president of the Chamber of Deputies, and the following May again became Premier, but resigned his office in January 1895. Upon the assassination of President Carnot in June 1894, M. Dupuy was the strongest rival of M. Casimir-Périer, the successful candidate for the presi-

dency of the Republic. M. Dupuy is a Republican in politics; he is opposed to the priesthood and especially to the Jesuits. For an account of the Dupuy ministry of 1898, see FRANCE (paragraphs on History).

DUPUY de LOME. See SPANISH-AMERICAN WAR (paragraph De Lome Incident).

DURYEY, JOSEPH TUTHILL, D. D., pastor of the First Reformed church, Brooklyn, died in Boston, Mass., May 17, 1898. He was born at Jamaica, Long Island, N. Y., in 1832; was educated at Princeton College and Seminary. He was pastor of a Presbyterian church in Troy, N. Y., for three years, going from there to the Collegiate church in New York City. In 1867 he went to the Classon Avenue Presbyterian church, Brooklyn, remaining until 1879, when he accepted a call to the Central Congregational church, Boston. During his pastorate, which continued until 1888, he taught the senior class in philosophy at Wellesley College. From 1888 to 1895 he was pastor of the First Congregational church in Omaha, Neb.; during the hard times of the winter of 1893, Dr. Duryea was active in relieving the sufferings of the poor. He resigned the Omaha pastorate and the same year (1895) became pastor of the First Reformed church, Brooklyn. He was a deep thinker and impressive speaker.

DUTCH BORNEO. See BORNEO.

DUTCH GUIANA, or SURINAM, is a dependency of Holland, lying between British Guiana and French Guiana on the northeast coast of South America. It is divided into sixteen districts whose aggregate area is 46,060 square miles, and had a population at the close of 1895 of about 63,000, exclusive of the negroes inhabiting the forests. The capital, Paramaribo, has about 29,000 inhabitants. The executive authority is vested in a governor with a council consisting of an attorney-general and three members, all of whom are appointed by the crown. Of the representative body, which is known as the Colonial States, four members are appointed annually by the governor, and the rest elected, the ratio being one representative for 200 electors. Besides a judicial court, all of whose members are named by the crown, there are three cantonal and two circuit courts. The chief products are cacao, sugar, molasses, rum, rice, and maize. Gold is found, the mining being carried on chiefly in placers, though recently a few crushing plants have been introduced. The gold taken from the beginning of the mining industry in 1876 to 1896 amounted to 1,307,383 guilders; the production in the latter year was 846,366 grammes. In 1895 there had been 291 concessions covering 264,040 hectares. The amount (in guilders) of foreign commerce, expenditures, local revenues, and the subventions appropriated by the Netherlands government have been as follows:

	Imports.	Exports.	Expenditures.
1894	6,225,076	5,062,814	
1895	5,203,029	5,490,735	2,094,000
1896	5,335,180	4,391,728	2,084,000
1897			2,245,498

	Local Revenues.	Subvention.
1895	1,726,000	368,000
1896	1,775,000	309,000
1897	2,020,739	224,759

The chief items composing the local revenue are import, export, and excise duties, and real, personal, and some indirect taxes. At the end of 1895, the colonial savings bank had a balance of 544,148 guilders. Communication is effected chiefly by small sailing and steam vessels. There is a small militia and navy of a few guard ships and some vessels of the royal navy. The government grants religious liberty, the most prominent denominations having in 1895 the following numbers: Moravian Brethren 27,055; Roman Catholic 10,634; Hindus 9,326; Reformed and Lutheran 8,826; Mohammedans 2,594; Jews 1,225. In 1895, besides a central school of the Moravian Brethren and of the Roman Catholics, there were 19 public schools with 2,131 pupils and 32 private schools with 4,865 pupils.

DWIGHT, TIMOTHY, D. D., LL. D., president of Yale University, on November 17, 1898, tendered his resignation, to take effect at the end of the academic year. This action, explained in the letter of resignation, was based on his conviction that no one beyond the age of seventy ought to continue at the head of a large university. Dr. Dwight was urged by the corporation to remain in office until Yale's bi-centennial celebration in 1901, but he declined to change his decision, and the resignation was accepted on December 13, the corporation adopting resolutions expressive of its high regard for his character and its appreciation of his services to the University.

Along with Dr. Dwight's resignation came that of Prof. George J. Brush, director of the Sheffield Scientific School.

Dr. Dwight was born at Norwich, Connecticut, November 16, 1828; his father was James Dwight, third son of Timothy Dwight, who was president of Yale from 1795 to 1817. After his graduation at Yale in 1849, Dr. Dwight studied theology there and from 1851 to 1855 acted as a tutor in the college. After three years study at Bonn and Berlin, he was called to the chair of sacred literature and New Testament Greek in the Yale theological school. In 1873-74 he was a member of the American committee for the revision of the English version of the Bible. He has been for many years on the editorial staff of the *New Englander*. On July 1, 1886, Dr. Dwight became president of Yale; both before and after his presidency began he did much for both the educational and the financial interests of the institution. He was known as the "great mechanical reconstructionist of Yale" and under him it became a great university, developing and expanding in all departments.

EARTHQUAKES. The earthquakes which are recorded for the United States in 1898 are distributed as follows: Alabama, 1; Arkansas, 2; California, 12; Indiana, 1; Kentucky, 4; Maine, 1; Montana, 1; Nebraska, 1; New Hampshire, 1; New Jersey, 1; Tennessee, 1; Vermont, 1; Washington, 5; Wyoming, 1. Most of these were very slight with the exception of one on March 30 in California, which was felt severely at a number of localities. A curious feature of it was that at San Francisco there was no preliminary tremor. One building 19 stories high swayed, and the water in the bay rose two feet.

Two earthquakes are reported from Cuba, two from Port au Prince, two from Nicaragua, one from Chili, and a severe one from Messina, Italy.

EAST AFRICA is the term applied to the British, German, and Portuguese possessions on the eastern coast of Africa extending from Abyssinia on the north to the British colony of Natal on the south. See the articles **EAST AFRICA, BRITISH**, **EAST AFRICA, GERMAN**, and **EAST AFRICA, PORTUGUESE**.

EAST AFRICA, BRITISH, includes the protectorates extending along the eastern coast between Somaliland on the north and German East Africa on the south, and westward into the interior to the White Nile, which borders on the Congo Free State, and beyond the portion of that river which is north of the Congo Free State into the Bahr-el-Ghazal district, the region the British claim to which was disputed by France in 1898. These protectorates are administered by commissioners and not directly by the imperial government. The British control in this region dates from very recent times. Agreements with Germany in 1886 and 1890 define the southern boundary and an agreement with Italy in 1891, the northern. Roughly estimated the region comprises about 1,000,000 square miles. The sultan of Zanzibar formerly held the entire coast but in 1886 his dominions were limited to a strip ten miles deep extending from Cape Delgado to the Ozi river. In 1888 the Imperial British East Africa Company received its royal charter acquiring jurisdiction over the coast from the Umba to Kipini. It extended its control into the interior and finally was authorized to administer the territories between the Indian ocean and the Equatorial lakes. By 1892 its sway extended as far as Lake Albert Edward and Uganda but the company did not pay and was dissolved in 1895. British protectorates were then declared over its territories and at present (1898) they are divided into (1), the **EAST AFRICA PROTECTORATE**, (2) the **UGANDA PROTECTORATE**, (3) the **PROTECTORATE OF ZANZIBAR**. See the articles on these topics.

EAST AFRICA, GERMAN, the most important of the German possessions in Africa extends from the eastern coast to the interior beyond Lake Victoria Nyanza in the northwest, Lake Tanganyika on the west and Lake Nyassa on the southwest. It has an estimated area of 380,000 square miles and coast lines of about 620 miles and a population placed at 4,000,000. The principal settlements on the coast are Dar-es-Salaam, Bagamoyo, Saadani, Pangani, Kilwa, and Tanga. Its boundaries were defined by various treaties, the terms of which marked as a rule a withdrawal of Germany from tracts formerly claimed. The enterprising geographer, Dr. Peters, has penetrated into this region and a German writer says that had German diplomacy acquiesced in the plans of this explorer the flag of Germany would be waving to-day over Uganda, and the provinces of the Sultan of Zanzibar. Nevertheless the tract of eastern Africa assured to Germany by these treaties is in some respects the most valuable portion of the eastern country. There are valuable forests near the coast containing the mangrove, cocoa plant, tamarind, baobab, etc., and in the more elevated tracts there is an abundance of acacias, cotton trees, sycamores, banyans, etc. The natives raise goats, sheep and cattle and in the more thickly settled portions follow agriculture. Bananas, pulse and maize are raised and there are plantations of coffee, cocoa palms, vanilla, tobacco, caoutchouc, and cacao. The country is said to have great mineral resources including coal, iron, malachite, and salt.

The export trade in ivory has been important, although the writer above quoted (F. Bley, formerly a district governor in East Africa) thinks that the day is not far distant when the elephant herds will be extinct. In the bottom lands of this region the sugar cane, tobacco, rice and spices can be raised in abundance and in some parts the coffee plantations are very successful. In the interior, particularly near the borders of Nyassa, the country has the advantage of moist soil and at the same time a healthful climate owing to the high altitude. A railway already open for traffic from Tanga to Pongwe is being pushed on toward Karagwe, the latter being a Central African state which belongs mainly to the German sphere of influence. The natives are of a mixed Bantu race and are divided into various branches. As a general characteristic they show a tractable disposition, a readiness to work and often a high degree of intelligence. There are Protestant and Catholic missionary societies carrying on active work in the country. Recently there has been a movement to establish in German East Africa a peasant settlement but the work of transplanting the surplus population of Germany to African colonies has not yet been effectively carried out.

EAST AFRICA, PORTUGUESE, extends along the eastern coast of Africa from German East Africa on the north to Tongaland (a dependency of the British colony of Natal) on the south and is cut off from the interior by British Central Africa, British South Africa and the South African Republic (Transvaal). It has an area of about 301,000 square miles and a population of about 3,120,000. It is divided into the districts of Mozambique, Zambezia, and Lourenço Marques. The chief ports are Mozambique, Quilimane, Ibo, Chinde, Beira, and Lourenço Marques. It is governed by a royal commissioner. Its principal railways are the Delagoa Railway (q.v.) and Beira Railway, which when completed will connect Beira, Fontesvilla, Massikesse, and Fort Salisbury. There are about 950 miles of telegraph line.

EAST AFRICA PROTECTORATE, a British protectorate, extending from the Umba to the Juba River and into the interior as far as Uganda, has a population estimated at 2,500,000. Its capital, Mombasa, with a fine harbor, has a population of about 24,700. For administrative purposes the country is divided into four provinces. Its products and principal exports include ivory, cattle and goats, India rubber, grain, copra, gum copal, hides and horns. Trade is said to be on the increase in spite of recent difficulties with the natives. A railway is in process of construction from the coast to Lake Victoria in Uganda. In February, 1898, 120 miles had been completed and in November it was reported that 235 miles were laid, and that the work was progressing at the rate of one-half a mile a day. The completion of this line together with that which is being laid by the Anglo-Egyptian expedition, will open communication through eastern Africa from the Mediterranean Sea to the Indian Ocean. The East Africa Protectorate is administered by a commissioner and consul-general, and each of the four provinces by a sub-commissioner. In 1898 the commissioner and the consul-general was Sir Arthur H. Hardinge. The United States Consular Report published in October, 1898, states that the commercial future of British East Africa is very promising. Mombasa, the capital, has become an important centre of trade. The soil of the country is for the most part fertile and well watered. A great part of the country is a high plateau and the climate is healthful and well suited to the culture of vegetables and fruits.

EATON, WILLIAM WALLACE, died at Hartford, Conn., September 21, 1898. He was born in Connecticut in 1816. He was a member of the State assembly, a State Senator in 1850, and for nine sessions a member of the House of Representatives, being speaker of the House in 1853 and 1873; in 1874 he was elected to the Federal Senate as a Democrat, and in 1882 was Representative in the XLVIIIth Congress. He was one of the best known Connecticut Democrats and had been active in both State and National politics.

EBERS, Dr. GEORGE MORITZ, the eminent German Egyptologist and novelist, died at his home in Tutzing, near Munich, August 7, 1898. He was born in Berlin, March 1, 1837; after a course of study at Göttingen and Berlin, he taught at Jena 1864, and four years later became professor of Egyptology at Leipzig. His special interest in archæology resulted in many valuable discoveries; the best known is probably the scroll dating from the second century B. C., and found by him near Thebes, now named "Papyrus Ebers" (1872-73). Although it is through his novels that Dr. Ebers is most widely known, he was primarily a scholar, and had won a firm reputation in archæology, philology, and general classical erudition before the appearance of his first novel, *An Egyptian Princess*, in 1864. He entered more fully in 1876 upon the less strenuous labor of romantic composition on account of ill health, and by the time of his death his writings were almost equally divided between fiction and learned treatises upon Egyptian, classical, and historical subjects. It is safe to say that Dr. Ebers was among the foremost of contemporary German

novelists. His works show imagination, and considerable emotional power, but lack that high creative force, those unmistakable touches of genius, which mark such widely different writers as Scott and Thackeray, Tolstoi and Daudet. His sixteen novels deal with ancient scenes and characters and not only possess the atmosphere of the times portrayed, but are full of accurate historical detail. The *Egyptian Princess* has never lost popularity and Dr. Ebers's second novel *Uarda* has enjoyed an enormous success. Among his other works are: *Egypt and the Books of Moses*; *Through Goshen to Sinai*; *The Sisters*; *Margery*; *Homo Sum*; *Per Aspera*; *The Story of My Life*; *Cleopatra* (1894); *In the Fire of the Forge* (1895); *In the Blue Pike* (1896).

ECONOMIC ASSOCIATION, AMERICAN, organized in 1885, has 600 members; Prof. Arthur T. Hadley, President; Prof. W. F. Wilcox, Ithaca, N. Y., Secretary. It held its eleventh Annual Session at New Haven, Conn., December 27-29, 1898. The opening address by the President, Prof. Arthur T. Hadley, on "The Relation of Economics to Politics" was an appeal for a more active participation by economists in public affairs. He pointed out that economists have not exercised the same influence during the greater part of the nineteenth century that they had at first, although he saw signs that in the last thirty years they were coming into closer contact with public affairs. To appreciate the slight influence which the conclusions of economic students have had on practical affairs one has merely to notice the tax and currency legislation of this and other countries. In these laws there are seldom traces of careful economic research. To infer from this that the work of the economist is worthless is superficial because motives of self-interest have especial force in the subject matter with which the science of economics deals. In cases where the principles of a science can be quickly subjected to the test of success or failure, Prof. Hadley shows that there is substantial agreement. For instance, at a given time and in a given country there is but one school of law, and lawyers who tried to practice according to another school or to introduce evidence based on other principles, would soon be ruled out. In medicine the case differs somewhat, for the test of success is by no means quick or certain. The best of medicines will only postpone death and the cause of recovery is often obscure. We should, therefore, expect to find what is actually the case, that is, the existence of different schools of medicine. As an illustration of a department of thought in which even greater discretion takes place Prof. Hadley cites theology. Here the test of success or failure is postponed to the next world and we consequently find innumerable schools of thought. In dealing with the complicated affairs of the industrial world a prompt test by success or failure is impossible. Bad economic measures do not at once bring destruction, nor do good ones bring immediate prosperity. If men looked at business affairs in a wholly disinterested and philosophical manner unanimity in economic views would be far more complete. But, as the author of the paper says, political economy has no chance with a man whose only idea on the subject of foreign trade, for instance, is that he can get a higher price for his goods if foreign goods are shut out, or with the man who assumes as an axiom that the tariff is robbing him. Prof. Hadley suggests that if a large part of the human race thought that the sun's revolution around the earth put money in their pockets, nothing would ever convince them that the earth revolved around the sun. These considerations explain the comparative lack of influence which men who devote their whole lives to the study of economics have upon actual legislation. In spite of them, however, he thinks that an increasing proportion of the population are ready to pay some attention to the teachings of economists.

The president's address was followed by the presentation and discussion of the report prepared by a special committee of the Association on the "Scope and Methods of the Twelfth Census". The report contained many suggestions regarding methods for improving the statistical work in future censuses, pointing out incidentally certain defects of method in previous censuses, especially in that of 1890. (See article CENSUS.) As bearing further upon statistical matters two specific questions were presented (1) "Is it Possible to Get Statistics of Capital and Industry?" (2) "What May and Should the Statistics of Municipal Finance Be Made to Show?" The discussion on the first was led by Hon. S. N. D. North, Hon. Horace Wadlin and Prof. H. C. Adams; and on the second by Prof. H. B. Gardner, Prof. L. S. Rowe, and Dr. M. R. Maltbie.

On December 29th an important report was presented by the Association's Special Committee on Reform of the Currency. This report advances practically the same ideas as those put forward by the Indianapolis Monetary Convention two years ago, and it supports these ideas by practical and lucid statements. It recommends an explicit declaration of the gold standard in order to remove any doubt on that point. It shows the helplessness of gaining elasticity for our currency under present conditions; for with \$800,000,000 of paper currency to be kept at par it is impossible that

our currency should quickly respond to the demands of trade. Such a currency does not contract or expand in the quick, automatic manner that is required under the fluctuating conditions of modern business. It cannot be exported nor can it be augmented except by artificial means. The report dwells on the need of a banking system that shall provide a currency that is at once safe and elastic. It emphasizes the view already expressed by practical business men that the supply of money in parts of the country remote from business centres is a matter of great importance, and should be afforded by the establishment of small banks of issue and deposit, or of branch banks. It finds one of the causes of the "cheap money" movement in this scarcity of currency in certain parts of the country at certain seasons. Such a stringency is the most conspicuous feature of the existing currency in those parts and it is natural that those who suffer from it should jump to the conclusion that "cheap money" is the proper remedy. An elastic currency, by removing this evil would, it is thought, bring men to sounder views on the whole subject of currency. The report points out that the general prosperity at the close of the year 1898 makes prompt action most desirable for business is in the best possible condition to stand the change.

On this same subject of the currency, Prof. F. W. Taussig, of Harvard University, read a paper entitled "*Some Aspects of the United States Treasury Situation in the Years 1893-1897.*" The following were some of its important points: The paper states that between November 1895, and October 1896, the Treasury held in its vaults continuously \$100,000,000 and more of legal tender. These notes began to accumulate in 1894, but the great body of them came in in 1896. Prof. Taussig says that although this must have been the result of deliberate policy on the part of the administration, yet, strange to say, not one word concerning it had been said in the official Treasury Reports. It was the outcome of the depression following the crisis of 1893 when the currency was redundant. It was the crude but temporarily effective device for avoiding the difficulty entailed by the so-called "endless chain." During this time of redundancy the notes paid out returned promptly to the Treasury. By impounding them the Treasury put an end for a time to the excess of the circulating medium. "This artificial elasticity was secured only at the expense of the great bond issues of 1894-96, and the uncertainties which accompanied these troublesome operations." When business began to revive at the end of 1896 there was a demand for these legal tenders and the notes which had been accumulated were now issued and remained in circulation. Prof. Taussig thinks that the same thing may happen whenever depression recurs. He points out the likeness of the situation in 1894-96 to that in 1884-86. In the latter period it was the silver currency which the Treasury hoarded. The author concludes with an account of the disadvantages under which the Treasury labors so long as this system is maintained. It is responsible for a great mass of silver and paper currency and has no means of adapting its issues to the demands of trade.

Space will not permit the summary of the other important papers read before the Economic Association but their titles and the names of the writers are as follows:

Early Canal, Railway and Banking Enterprises of the States, in Relation to the Growth of Corporations in the United States. G. S. Callander, Harvard University.

Prices and Price Movements in the Confederate States During the Civil War. Professor J. C. Schwab, Yale University.

Recent Economic Changes in the State of Massachusetts. Professor C. S. Walker, Massachusetts Agricultural College.

Dynamic Standards of Wages and Interest. Professor J. B. Clark, Columbia University.

The Present Study of Practical Labor Problems in France. Dr. W. F. Willoughby, United States Department of Labor.

Municipal Taxation as a Means of Public Control of Corporations. Mr. C. E. Curtis, City Bank, New Haven, Conn.

The Nature of Municipal Franchises. Dr. Max West, U. S. Department of Agriculture.

ECOLOGY. See BOTANY (paragraph Ecology and Plant Geography).

ECUADOR, a republic lying between Colombia and Peru on the Pacific coast of South America, consists of sixteen provinces and one territory, whose area aggregates about 120,000 square miles. No census has been taken, but according to the last official estimate the population was 1,271,861; of these 100,000 are of Spanish descent; 300,000 of mixed blood (Spanish and Indian); and 870,000 are Indians. The most populous province is Pichincha with 205,000 inhabitants, and the least populous, Esmeraldas with 14,553. The capital is Quito (population 80,000); the other important towns are Guayaquil (50,000), Cuenca (25,000), Riobamba (12,000), Ambato Loja, and Latacunga (each about 10,000).

Government.—Ecuador became an independent state upon its withdrawal from the original Republic of Colombia in 1830. Its present constitution, framed in 1882 and modified in 1887, is modelled somewhat on that of the United States. The executive authority is vested in a president who is assisted by a cabinet of five ministers; the president and vice-president are elected by popular vote for terms of four years, but the elections are not simultaneous, the one being two years subsequent to the other. The president and cabinet together with seven others form a council of state. The president in 1898 was Gen. Don Eloy Alfaro. The legislative power devolves upon a congress consisting of a senate and a house of representatives, members of the former being elected for four years, one-half retiring every two years, there being two senators chosen from each province; and members of the latter, or deputies, being chosen for two years, at a proportion of one deputy for each 30,000 inhabitants. Legal electors for both senators and deputies, as well as for president and vice-president, are adults who can read and write and are Roman Catholics. Governors appointed by the government administer the provinces. Besides inferior courts, which deal with civil, criminal, and commercial cases, there are the appellate courts, comprising six superior courts at different places and the Supreme Court in Quito. There are 33 cantonal and 359 parochial justices and consular courts at Quito and Guayaquil. The president receives an annual salary of 12,000 sucres and each minister 2,880 sucres.

Finance.—The ordinary revenue from June 1895 to July 1896, was 5,128,620 sucres, and the extraordinary revenue, which was chiefly loans from banks, was 3,730,740 sucres, the total being 8,859,360; expenditure for same period was 8,779,520 sucres. For both 1897 and 1898 the revenue was estimated in sucres at 9,093,551 and the expenditure at 11,005,141. About 70 per cent. of the revenue is derived from customs; the greater part of the remainder comes from taxes on cocoa, white rum, tobacco, real estate, and from government monopolies, rents, and the postal department. The foreign debt is about 7,890,000 sucres (about \$3,440,000) and the internal debt (1896) is 7,500,000 sucres (about \$3,270,000).

Army and Navy.—The army comprises one brigade of field and one of fortress artillery, one regiment of cavalry, four battalions of infantry and two columns of light infantry, aggregating in all 3,341 officers and men. There is said to be a national guard of 30,000 men. The navy is made up of a torpedo launch and a transport.

Industries and Commerce.—The country, situated directly under the Equator, is essentially agricultural, and an immense variety of tropical flora grows most luxuriantly; it is said also to be rich in precious metals, silver, quicksilver, copper, iron, lead, coal, and petroleum, but the mining industry has not made great progress. Among the principal exports are cacao, coffee, rubber, hides, cinchona bark, vegetable ivory, and tamarinds. The chief products also include, along the coast, all kinds of tropical fruits, and, in the cultivated parts of the interior, sugar cane, cereals, cabinet woods and dyewoods, and the stemless screw pine from which the well known Panama hats are made. In the early part of 1898, it was reported that almost all of the accessible rubber forests had been exploited, and it being feared that this industry might soon come to an end it was necessary to begin the cultivation of the rubber tree. A newly proposed railroad to Quito will open up large areas of original rubber forest. Manufacturing industries are but little developed; there are, however, flour, sugar, cotton, and hat factories, sawmills, tanneries, and distilleries. Cacao, the staple product, in 1895 was received at Guayaquil to the amount of 16,122 tons and in the following year 15,327 tons. The principal imports are cotton and other textiles and provisions. The following has been the value in sucres of foreign trade; the figures for 1894 and 1895 refer only to Guayaquil:

	1892.	1893.	1894.	1895.
Imports	8,377,897	10,052,163	12,000,000	8,520,000
Exports	12,086,185	14,052,514	13,933,750	11,562,740

In his annual message to the congress August 9, 1898, President Eloy Alfaro reported that the general condition of the country was improving. He reported a reorganization of the statistical department of the custom house,—so that hereafter the customs reports may be trusted,—and he stated that the exports of 1897 were nearly 50 per cent. greater than those of the preceding year. The figures that he gave for foreign trade were:

	Exports.	Imports.
1896	21,862,324 sucres (\$9,138,451)	
1897	31,025,382 sucres. (\$12,968,609)	18,004,048 sucres. (\$7,525,692)

President Alfaro said that, on account of the constant underestimation of values at the custom house, the actual amounts for 1897 were probably 25 per cent. higher than the figures given above. Thus the true value of the imports was at least 22,000,000 sucres (\$9,196,000). The government proposed to raise the official valuation upon which duties are calculated and a commission was appointed for the purpose.

Efforts have recently been made to promote the cultivation of the rubber tree in the hope that the rubber crop might be made to equal the cocoa and coffee crops which have been hitherto the chief products of the country. The ruthless destruction of the wild rubber tree has led to the scarcity noted in a preceding paragraph. A report of the United States Consul-General dated February 26, 1898, states that Ecuador produces every known species of the rubber tree in great abundance, and that planting is easy and inexpensive. Steps have been taken to obtain from the government an eight-year concession covering eight or ten square leagues of land in the province of Tungurahua. The Consul-General says: "The thousand and one uses to which rubber is now applied renders it one of the most valuable products of these countries, and offers a tempting field for United States investment. The barbarous methods referred to, in use by ignorant 'Cholos' and semi-savage Indians, will undoubtedly be replaced by civilized and intelligent processes. There are immense tracts of land in Ecuador suitable for rubber cultivation which can be had for a mere song, and I am satisfied that President Alfaro would warmly welcome American capitalists and settlers. The latter should have sufficient means to support themselves until the tree reaches maturity. Living in this country is very cheap, nearly everything growing spontaneously. Food is inexpensive and but little clothing is necessary. Should the projected railroad to Quito become a reality, immense tracts of rubber forests will be rendered available for exploitation which at present are too remote to be utilized."

Shipping and Communications.—In 1896 there entered at Guayaquil 450 sailing vessels, representing 20,643 tons, and 394 steamers, representing 256,933 tons; total, 844 vessels, 277,576 tons. During the same period there cleared from Guayaquil 469 sailing vessels; representing 17,297 tons, and 402 steamers, representing 257,053 tons; total, 871 vessels 274,350 tons.

The forests and mountainous surface of Ecuador render internal communication difficult. The roads are usually merely bridle paths. To some extent the inland waters are navigated by a few steamers of American or native build, while there is a large number of accessory small boats and canoes. There is one railroad, 58 miles in length, connecting Durán (opposite Guayaquil) with Chimbo. In the latter part of 1897 a contract was made between the government and a New York capitalist for the extension of this road to Quito, the capital of the Republic. Much difficulty will attend the successful completion of this enterprise, for the route proposed, which is 404 miles in length, rises at points to as much as 12,300 feet above the sea level, and crosses so many streams and ravines that, it is said, the construction of 830 bridges will be necessary. The estimated cost of the road is \$17,500,000.

There are about 1,242 miles of telegraph lines and 60 stations; a telegraphic marine cable touches at Guayaquil.

Religion and Education.—The state religion is Roman Catholic, and provision is made for the church in the annual budget. Other faiths are excluded. The schools of Ecuador according to the latest statistics available in 1898 were: nine of higher education, 35 secondary, and 1,088 primary; primary education is free and compulsory. The teachers number in all 1,498, and the pupils, 68,380. At Guayaquil and Quito there are commercial and technical schools, besides in the latter city a university which has 32 professors and 216 students.

Money.—As Ecuador has no mint, the national currency is coined at Birmingham and in Chile and Peru. The amount of silver minted in 1890 was valued at £77,000; in 1892, £43,000. The silver coinage for the four years ending 1889 was about 1,835,000 sucres. There is no gold in circulation. The sucre is worth \$0.436 in United States gold (estimate October 1, 1898). There are two banks of issue, having an aggregate capital of 2,400,000 sucres; there are also other banks, one of which has a capital of 2,000,000 sucres.

EDUCATION IN THE U. S. The United States in founding in 1867 the national Bureau of Education at Washington set an example to the whole world. The work of this bureau is the collection and dissemination of information concerning education primarily, but it has also the administration of the schools of Alaska (q. v.) and a limited supervision of the expenditures for land-grant colleges. The Commissioner (W. T. Harris, appointed 1889) issues an annual report covering in two volumes of over 1,000 pages each, as far as possible the whole educational field during the preceding year. Tables from the last report issued January 1899, showing the main statistics of education, are here appended:

Statistics of State Common School Systems, 1895-1896.

	Pupils enrolled.	Average number of pupils attending school each day.	Average number of days the schools were kept during the year.	TEACHERS.			Estimated value of all school property.	Total expenditure during 1895-1896.
				Male.	Female.	Total.		
UNITED STATES.....	14,879,078	9,747,015	140.5	130,806	399,959	400,835	\$455,946,164	\$134,453,780
North Atlantic Div'n	3,463,912	2,394,190	175.5	18,619	78,448	97,067	178,586,923	67,668,543
South Atlantic Div'n	2,000,314	1,250,885	107.8	20,106	24,968	45,119	19,315,946	11,108,156
South Central Division	2,689,588	1,794,964	93.0	81,386	27,960	69,318	20,568,290	12,294,440
North Central Division	5,510,463	3,309,542	151.8	54,042	123,590	177,922	200,133,730	73,852,365
Western Division.....	714,931	497,414	142.0	6,211	14,688	20,899	37,322,285	13,512,398
North Atlantic Div.								
Maine.....	134,140	94,912	126.0	1,208	5,518	6,726	3,738,506	1,626,586
New Hampshire.....	62,497	42,080	124.75	290	2,907	3,197	3,066,324	920,808
Vermont.....	65,411	46,261	154.0	879	2,572	2,951	1,600,000	1,067,727
Massachusetts.....	424,363	321,466	185.9	1,078	11,197	12,275	36,790,727	11,339,191
Rhode Island.....	59,241	41,691	190.0	185	1,517	1,702	4,147,279	1,623,549
Connecticut.....	141,485	98,925	187.47	488	3,559	3,992	8,839,148	2,798,831
New York.....	1,176,074	772,054	175.00	5,421	29,359	33,280	60,393,126	22,172,820
New Jersey.....	890,380	175,895	184.00	779	4,841	5,620	11,929,227	4,971,444
Pennsylvania.....	1,120,441	808,737	159.6	8,798	17,968	26,764	48,143,068	19,061,530
South Atlantic Div.								
Delaware.....	33,174	22,698	180.00	218	622	840	304,438	275,000
Maryland.....	312,282	122,327	182.00	1,104	3,510	4,616	4,000,000	2,584,532
District of Columbia..	43,464	32,153	182.00	186	896	1,081	3,290,000	1,050,269
Virginia.....	383,133	209,528	119.00	3,008	5,414	8,417	3,070,610	1,219,563
West Virginia.....	215,666	141,081	111.00	8,628	2,326	6,454	3,227,141	1,793,549
North Carolina.....	870,920	281,725	85.4	4,294	3,591	7,885	1,002,163	617,548
South Carolina.....	392,297	170,801	71.4	2,028	2,419	4,447	744,673	529,323
Georgia.....	453,786	264,142	110.5	4,807	4,414	9,221	2,478,188	1,066,909
Florida.....	100,878	66,136	102.00	1,043	1,422	2,506	628,340	596,927
South Central Div.								
Kentucky.....	400,126	286,961	115.00	4,990	5,247	10,239	4,316,750	2,916,045
Tennessee.....	478,126	338,330	92.4	5,157	3,736	8,918	3,092,508	1,667,894
Alabama.....	319,228	204,000	89.2	4,280	2,961	7,181	1,373,000	663,369
Mississippi.....	202,515	202,933	105.4	3,647	4,206	7,855	1,636,055	1,272,500
Louisiana.....	144,717	115,316	105.8	1,391	2,146	3,537	960,000	1,226,586
Texas.....	616,568	440,249	92.8	6,815	6,402	13,217	7,359,184	3,906,778
Arkansas.....	296,575	171,948	89.88	4,391	2,228	6,673	1,679,398	1,222,998
Oklahoma.....	63,686	35,597	80.00	705	1,028	1,733	371,460	305,236
North Central Div.								
Ohio.....	620,522	597,925	166.00	10,305	14,375	25,180	30,177,976	12,226,910
Indiana.....	543,665	401,702	142.5	7,180	7,754	14,894	18,897,494	7,102,574
Illinois.....	894,619	681,525	157.9	7,057	18,350	25,416	43,786,475	16,201,121
Michigan.....	476,684	324,622	153.3	3,834	12,379	16,018	16,766,882	6,425,003
Wisconsin.....	412,514	271,000	160.0	2,440	9,394	12,334	11,100,000	6,678,824
Minnesota.....	354,957	230,596	155.6	2,544	3,975	11,519	14,271,771	6,300,216
Iowa.....	543,059	345,242	160.00	5,514	22,507	28,121	15,867,425	7,899,034
Missouri.....	664,947	432,386	140.00	5,918	14,844	20,762	15,032,082	6,994,513
North Dakota.....	57,088	38,478	107.5	1,043	1,984	3,027	1,936,430	1,125,843
South Dakota.....	88,026	54,500	135.00	1,368	3,448	4,816	3,434,806	1,687,918
Nebraska.....	272,310	174,837	156.9	2,700	7,368	10,068	8,779,760	3,375,716
Kansas.....	378,339	252,727	130.00	4,294	7,406	11,700	10,145,681	4,133,195
Western Division.								
Montana.....	23,876	19,443	149.2	226	720	956	1,983,265	748,173
Wyoming.....	11,552	7,700	90.00	106	960	1,066	423,706	211,313
Colorado.....	94,686	62,410	159.7	747	2,174	2,921	5,859,477	2,384,183
New Mexico.....	23,359	15,967	91.00	641	243	884	264,480	182,243
Arizona.....	12,689	7,641	125.8	118	311	429	453,965	214,009
Utah.....	66,710	46,663	152.00	496	662	1,158	2,471,396	849,730
Nevada.....	7,267	5,312	147.00	48	243	290	208,414	208,955
Idaho.....	32,500	24,356	104.00	362	465	727	712,681	292,357
Washington.....	90,113	63,212	89.2	1,164	2,061	3,245	4,837,418	1,455,519
Oregon.....	87,312	61,721	109.00	1,287	2,030	3,317	2,968,812	1,197,109
California.....	359,697	184,124	174.00	1,405	5,490	6,895	17,100,184	6,801,759

Other Educational Statistics, 1900-1907.

STATISTICS OF EDUCATIONAL INSTITUTIONS ABOVE THE GRADE OF ELEMENTARY SCHOOLS.																
	UNIVERSITIES AND COLLEGES.		LAW SCHOOLS.		MEDICAL SCHOOLS.		SCHOOLS OF THEOLOGY.		NORMAL SCHOOLS.		HIGH SCHOOLS.		CITIES OF OVER 8,000 IN- HABITANTS. ^c	PUBLIC LIBRARIES OF 30 VOLUMES AND OVER.		
	Number.	Students.	Number.	Students.	Number.	Students.	Number.	Students.	Number.	Students.	Number.	Students.				
		Collegiate.		Prepara- tory and other.												
UNITED STATES.....	877	97,134	69,014	77	10,448	148	24,305	157	6,173	803	67,380	517,080	601	8,580,875	7,184	84,594,368
North Atlantic Division.....	115	30,870	9,499	13	3,580	27	7,885	49	8,062	19	19,898	186,987	223	1,697,615	2,913	18,144,164
South Atlantic Division.....	182	18,361	8,116	17	1,587	21	5,013	23	857	68	5,580	58,911	43	4,737,737	498	4,030,919
North Central Division.....	145	18,361	12,416	13	1,012	30	8,435	18	817	80	7,518	61,511	53	1,031,874	497	1,475,955
South Central Division.....	238	98,237	32,317	28	4,293	68	9,881	40	3,197	124	80,438	232,118	227	1,247,387	2,238	8,898,084
Western Division.....	51	6,351	6,065	8	428	12	1,021	7	140	30	3,771	27,089	27	193,782	1,038	2,849,298
North Central Division.																
Ohio.....	42	5,644	6,147	5	588	15	1,388	13	507	19	4,593	40,803	46	240,491	345	1,654,480
Indiana.....	17	3,101	1,230	2	430	4	498	4	106	15	3,538	20,065	30	103,005	106	680,909
Illinois.....	26	6,120	7,240	7	1,223	12	2,661	14	1,222	13	3,487	26,303	39	319,000	349	1,899,572
Michigan.....	13	3,078	1,563	2	112	5	879	5	121	7	1,885	12,861	30	124,907	280	1,041,872
Wisconsin.....	10	1,845	1,311	1	194	2	189	4	103	6	2,523	11,146	21	100,163	130	690,558
Minnesota.....	10	2,441	984	1	365	3	887	5	300	7	1,476	18,144	154	78,778	154	604,906
Iowa.....	24	3,149	3,177	2	316	6	708	4	174	24	4,377	27,587	22	66,874	223	673,515
Nebraska.....	88	3,273	4,142	2	308	15	2,041	6	455	11	2,459	21,868	15	132,667	213	737,879
North Dakota.....	4	143	.....	.....	.....	.....	.....	.....	.....	3	357	997	23	81,145	23	40,288
South Dakota.....	7	486	717	.....	.....	.....	.....	.....	.....	3	487	1,645	36	1,259	36	40,288
Nebraska.....	11	1,461	1,465	1	77	3	187	3	51	3	1,166	12,641	10	37,307	73	245,288
Kansas.....	21	2,412	3,430	1	150	3	165	1	9	5	2,341	12,537	13	40,887	135	387,132
Western Division.																
Montana.....	4	88	396	.....	.....	.....	.....	.....	.....	.....	.....	1,043	3	8,200	23	73,013
Wyoming.....	1	69	80	.....	.....	.....	.....	.....	.....	.....	.....	350	3	24,235	5	24,235
Colorado.....	6	755	997	2	75	4	225	2	37	3	513	4,582	9	37,064	55	311,061
New Mexico.....	2	68	112	.....	.....	.....	.....	.....	.....	.....	.....	297	10	13,744	10	13,744
Arizona.....	1	302	117	.....	.....	.....	.....	.....	.....	.....	.....	382	6	15,438	6	58,089
Utah.....	1	143	1,008	.....	.....	.....	.....	.....	.....	.....	.....	1,786	2	15,438	24	58,089
Nevada.....	1	64	130	.....	.....	.....	.....	.....	.....	.....	.....	482	.....	.....	.....	50,589
Idaho.....	1	64	130	.....	.....	.....	.....	.....	.....	.....	.....	482	.....	.....	.....	50,589
Washington.....	9	690	702	.....	.....	.....	.....	.....	.....	.....	.....	3,133	4	15,438	7	13,923
Oregon.....	9	640	702	.....	.....	.....	.....	.....	.....	.....	.....	3,133	4	15,438	30	51,619
California.....	14	3,473	1,513	2	274	6	659	4	21	5	1,657	12,404	14	102,326	684	1,602,361

^a Does not include professional students, which are given in the statistics of professional schools.

^b Includes 2,100 private high schools and academies, with 107,468 secondary students, and 5,108 public high schools, with 408,488 secondary students. The public high schools are also included in the table giving statistics of State common-school systems.

^c The city school systems are also included in the table giving statistics of State common-school systems.

Higher Education in the U. S.—A strong movement has been inaugurated towards making more uniform the conditions upon which the degrees, ordinarily given by the great universities, are granted by many colleges and self-styled universities in the South and West, some of which are little if at all better than high schools. In New York and Pennsylvania charters may not be given to institutions whose work does not come up to the required standard. A strong protest is being made against the undue multiplication of honorary degrees with the same title as those which are generally supposed to be granted only after a course of study. Among these degrees that of Master of Arts (M. A.) is the most ambiguous and following that is the degree of Doctor or Philosophy (Ph. D.) which has been given as an honorary degree at numerous institutions. The commonest honorary degree is that of Doctor of Divinity (D. D.) which was given as an honorary degree to 323 persons in 1897. The Federation of Graduate Clubs of America has passed resolutions condemning the granting as honorary degrees those about which a strong tradition has grown up that they should be given only after a number of years' study after obtaining the baccalaureate degree (B. A.) and upon examination. The resolutions above mentioned state "that bachelor degrees are inappropriate as honorary degrees or *ex gratia* and should be made to signify always the completion of a recognized grade of undergraduate work in their respective departments" and that the degrees of Ph. D., Sc. D., Pd. D., and M. D., should never be given *honoris causa* nor *in absentia*. L. H. D., S. T. D., D. D., LL. D., D. C. L., and Mus. D., are recognized as honorary degrees.

The great attention given to philosophical subjects in the post-graduate work of the different universities of the country is shown by the fact that in the twenty-four prominent universities of the United States, which enrolled in 1897-8 a total of 3,204 graduate students, 519 chose philosophy and ethics. History, politics and law followed with 488 students and English came third with 423. After these, in the order mentioned came (4) Classics; (5) Economics, Sociology and Anthropology; (6) Psychology and Pedagogy; (7) German; (8) Biology; (9) Mathematics; and (10) Chemistry; after which the list includes Romance languages, Physics, Geology and Geography, Indo-Iranian and Comparative Philology, Semitics, Astronomy and finally the Fine Arts and the History of Art.

The special technical and professional courses of study given by universities and colleges not themselves technical schools, are numerous. The professional instruction given in the greatest number of colleges, where the liberal education is the prime object, is in music, courses in which are offered by 328 colleges. Commercial courses may be taken at 216 institutions, Pedagogy at 211, Art at 175, Military Science at 104, Civil Engineering at 92. Theology at 90, and the following courses show most frequency in the order mentioned: Law and Mechanical Engineering, (73 colleges each); Electrical Engineering (70 colleges); Medicine (57 colleges); Agriculture (53 colleges); Domestic Science (34 colleges); Mining Engineering (33 colleges); Pharmacy (30 colleges); Veterinary Science (27 colleges); Dentistry (22 colleges); Architecture (16 colleges) and Sanitary Engineering (12 colleges).

Higher education is given in the U. S. in 472 colleges and universities for men and for both sexes, and in 14 for women only. These institutions employ 10,946 male and 1,592 female officers of instruction, and have an attendance of 116,401 male and 38,690 female students. This makes one college student to every 831 persons in the U. S. The largest proportion of college students is found in the Western States where there is one student to every 580 persons. In Nevada one out of every 268 of the population is a college student, in California one out of every 425, in Massachusetts one out of every 471.

The universities and colleges above mentioned have 382 fellowships, 5,463 scholarships, have libraries with 6,668,046 bound volumes and 1,737,981 pamphlets, scientific apparatus valued at \$16,014,347, grounds and buildings valued at \$120,142,990 and productive funds amounting to \$114,212,392.

The 14 colleges for women employ 248 male and 313 female officers of instruction, register 4,421 students, have 16 fellowships, 276 scholarships, and libraries aggregating 164,839 volumes.

For a complete list of universities for men, for women and for both sexes, see UNIVERSITIES AND COLLEGES.

Manual Training Schools.—In 95 cities of the U. S. a course in manual training was an essential feature of the instruction in the public schools. In 1896-7 there were 66 manual training schools with 551 teachers and 12,123 male and 7,718 female pupils. Instruction in the manual arts is provided for by law in many of the States of the Union, among them being Maine, Massachusetts, Connecticut, Georgia, Indiana, New Jersey, New York, Utah, Wisconsin and Wyoming; and appropriations are made by Congress for the support of manual training schools in Washington, D. C.

Commercial and Business Schools.—In the U. S. there were 93,931 students in commercial courses in various schools in 1896-7, of whom 56,002 were in the business and commercial courses of universities, colleges, normal schools, private high schools

and academies and public high schools and 37,929 in the commercial courses of business schools. There were 341 business schools with 1,764 instructors and 77,746 students, nearly a fifth of whom were in evening classes. The distribution of the students according to studies were as follows:

Course of study.	Males.	Females.
Commercial course.....	29,216	8,713
Amanuensis course.....	10,185	12,957
English Course.....	9,653	3,671
In telegraphy.....	897	312

Normal Schools.—In the year 1896-7 there were in the U. S., according to the latest report of the commissioner of education published Jan., 1899, 83,934 students pursuing training courses for teachers of whom 49,199 were in 164 public normal schools. Of the students in these schools 30,592, or more than 70 per cent., were women. The north Atlantic division, had 77 per cent. of the public normal schools of the U. S. the greatest number being in New York and Pennsylvania. In the public normal schools there were 1,800 colored students, the largest proportion of these being in the colored normal schools of the two southern divisions. The public normal schools were supported by State, county and city appropriations of nearly two million and a half of dollars, in addition to their income of half a million of dollars from tuition and over \$350,000 from other sources.

There were 198 private normal schools with 1,719 teachers and 24,181 students, about an equal number of men and women, with an income of \$1,026,077, libraries with 223,067 volumes and buildings, grounds and apparatus valued at \$6,911,131.

Besides this there were 2,650 men and 3,833 women pursuing training courses for teachers in 196 colleges and universities, 2,490 male and 6,511 female students of teaching in 507 public high schools, and in 422 private high schools and academies there were 3,068 male and 3,996 female students pursuing teachers' training courses. The total number of such students in schools other than the public and private normal schools was 22,544.

Subjoined is a table showing the distribution of normal students in the U. S.:

CLASSES OF INSTITUTIONS.	1894-95.		1895-96.		1896-97.	
	Institutions.	Students.	Institutions.	Students.	Institutions.	Students.
Public Normal Schools.....	155	36,276	160	40,421	164	43,199
Private Normal Schools.....	201	21,927	169	20,777	198	24,181
Public Universities and Colleges....	26	1,075	27	1,691	30	1,899
Private Universities and Colleges...	166	5,827	166	5,385	166	4,650
Public High Schools.....	438	6,809	447	8,246	507	9,001
Private High Schools.....	458	9,124	439	7,980	433	7,064
Grand total.....	1,439	80,538	1,408	84,400	1,437	88,934
In all public institutions.....	614	44,160	634	50,358	701	54,089
In all private institutions.....	825	36,378	774	34,042	736	35,895

Education of the Colored Race.—In the District of Columbia and 16 Southern States there were 1,460,084 colored children enrolled in public schools in the year 1896-7. this enrollment being 32 per cent. of the children of school age in those States; but 52 per cent. of the colored children of school age in these States were enrolled in the public schools. In three States, South Carolina, Louisiana and Mississippi, the colored school population is greater than the white school population. In Kentucky a greater proportion of the colored children attend school than of the white children. There were 27,435 colored teachers in the Southern States. In the U. S. there are 178 schools for the secondary or higher education of colored youth, 160 of which are in the Southern States; they employed 1,795 teachers, and had an enrollment of 45,402 more females than males; they had libraries aggregating 224,794 volumes and grounds and buildings valued at \$3,714,958.

Education of the Blind.—The first school for the blind in the U. S. was established in Boston in 1829. Thirty-two States now have such schools in successful operation. The last report of the U. S. Commissioner of Education (issued Jan., 1899) shows 336 schools for the blind with 387 instructors and 3,630 students of which 1,860 were in industrial departments where cane seating, mattress making, carpet weaving, machine sewing, typewriting, etc. are taught. These schools had libraries aggregating 95,879 volumes and grounds and buildings valued at \$6,183,538.

Education of the Deaf.—There were 95 schools for the deaf with 1,020 teachers and 10,429 students. There were 54 State public schools with 817 instructors and 9,391 students, who were taught in articulation, auricular development, and in industrial branches. The schools for the deaf had libraries aggregating 90,184 volumes; had scientific apparatus valued at \$21,394, and grounds and buildings valued at \$11,373,873.

Education of the Feeble Minded.—There were 28 schools for the feeble minded, with 492 teachers and 496 assistants, and 8,534 pupils. Instruction was given in three directions, moral, intellectual and industrial. There were 10 private schools for the feeble-minded with 101 teachers, 64 assistants and 357 pupils. Music among other branches is taught to 1,474 pupils out of the total given above.

Reform Schools.—In 1896-7 there were in the U. S. 88 reform schools with 485 instructors and 23,696 inmates. The value of grounds and buildings was \$16,319,017. Of the inmates 2,639 were colored, and 5,722 of foreign parentage. A large proportion could neither read nor write when admitted. All those discharged could both read and write, and three-quarters of them were reported as leading honest, respectable lives.

EGYPT. *Population and Area.* Trustworthy figures for the present population of Egypt are not obtainable, but there is evidence to show that in recent years the numbers have increased. In 1875 its population was 6,000,000 and in 1898 it was estimated at between 9,000,000 and 10,000,000. The capital, Cairo, has a population of about 570,000 and the commercial centre, Alexandria, of about 320,000. The area of Egypt is placed at 394,240 square miles, being about equal to that of the North Atlantic and South Atlantic States of the United States.

Foreign Commerce.—In the twenty-one years from 1875 to 1896 the imports of Egypt rose from \$25,000,000 to \$50,900,000, being an increase of over 100 per cent. The following table from the Consular Reports of October 1898, shows the imports by countries:

Country.	Value.
England and possessions.....	\$18,508,700
Turkey	9,958,000
France and possessions.....	6,060,000
Austria-Hungary	3,512,000
Belgium	2,296,000
Russia	1,852,000
Italy	1,659,000
Germany	1,408,000
Greece	405,000
United States.....	215,540

In 1896 the total exports were valued at \$68,000,000 and consisted chiefly of cotton, cotton seed, cane sugar, beets, onions, skins, and natural wools. About 35 per cent. of the exports were sent to England. The trade of the United States with Egypt has greatly increased in recent years. In 1896 it amounted to \$4,632,000 and in 1897 to \$7,489,243, consisting in the former year almost entirely of cotton and in the latter of cotton and sugar. In 1898 it was \$6,629,173. The Egyptian cotton trade has increased with extraordinary rapidity. It rose from 339,222 bales in 1875 to 680,960 in 1896, England receiving almost half of this amount. Egyptian cotton was introduced into the United States but ten years before and the growth of the trade has been remarkable. The American Consul General at Cairo drew attention in 1898 to the importance of the Egyptian market to American firms. With the opening up of Dongola he declared that an increase in the importation of textiles and other goods is certain to take place. The advantage possessed by England and Germany in Egypt, as in several other foreign markets, is said to be due to their maintaining agents in the country who understand the language, and to their refusing to rely exclusively upon trade circulars. Communication with the United States has been improved since the establishment of the new American Indian Line which passes through the Suez Canal and will stop at Suez whence there is railway connection with Cairo and Alexandria. The kinds of goods preferred by the Egyptian purchaser as shown from the list of imports from England, France and Germany, include all sorts of tools and agricultural implements, articles of carpentering, wooden ware, mining and milling machinery, sewing machines, wagons, stoves and ranges, and in short all such articles as advanced industrial communities are able more advantageously to produce. The use of machinery is gaining ground in Egypt and an increasing demand for its importation is probable. This of course means an increasing importation of coal which already forms an important item in the list of imports.

Egypt under British Control.—It will be remembered that in 1875 the English and French governments in the interest of the holders of the Egyptian debt induced the

Khedive to admit to his counsels two financial advisers, the representatives of the respective governments. It was hoped that by these means the financial condition of Egypt might be placed on a surer basis, but matters went from bad to worse and in 1877 a further attempt was made in the interest of the foreign bond-holders. At this time Ismail Pasha went so far as to promise to turn Egypt into a constitutional monarchy and to entrust the chief portfolios to French and English ministers. With the capriciousness of an Oriental despot the Khedive soon grew tired of this arrangement and dismissing his ministers resumed his former personal rule. The so-called "dual control" came about in this manner. The Egyptian government was induced to give jurisdiction over all civil cases involving Europeans to international tribunals which were to administer justice according to the new civil code. Now this code contained a clause that in the event of a suit against the state the property of the latter might be seized in the same way as the property of a private person. This was a most unusual principle, and one totally at variance with the principle of sovereign rights. Ismail Pasha claimed that this clause was inserted in the code without his knowledge. However that may be, it is certain that on finding it out he flew into a passion and declared that he had been betrayed. The significance of this clause appeared when a German bond-holder in whose favor an international court had pronounced proceeded under the judgment of the court to seize the properties of the state in default of payment of arrears. The Egyptian government opposed this action, but the German government interposed on behalf of its subject, threatening armed intervention if the latter's rights were not respected. Thereupon France and Great Britain, acting in harmony, required the Sultan to depose Ismail Pasha, thus re-establishing the sovereignty of Turkey over Egypt. Ismail was forced to abdicate, and his son Tewfik became Khedive. But the fallen ruler soon found a means of revenge. As a result of his instigation the officers of the army mutinied, and soon afterwards occurred a revolution headed by Arabi Pasha. The fanatical hatred of the Mohammedans for the Christians was an element in this revolt and led to the massacres at Alexandria which aroused the indignation of Europe. It was necessary that order should be restored, but as France refused to intervene, the task of suppressing the revolution devolved on Great Britain. To her alone belongs the credit of having pacified the country. British ships bombarded Alexandria; the British army defeated the Egyptians at Tel-el-Kebir; Cairo was re-occupied and Tewfik was restored to the throne. Thus Great Britain was forced into the position of the guardian of Egypt. It was a duty not relished by the ministry at that time. Neither Mr. Gladstone, nor his colleagues desired permanent occupation of Egypt by British forces; all that they wanted was the restoration of order and the establishment of authority until Egypt could take care of herself. Many thought that if Great Britain had at this time established formally a protectorate over Egypt it would have proved more advantageous to all parties concerned than the wavering and seemingly transitory arrangement which was effected. British troops garrisoned Cairo and Alexandria, and British officials gave aid and advice to the Khedive's government, but it was all done with the understanding that in a short time they would be withdrawn and Egypt would be left to shift for herself. The mistaken gentleness of Great Britain's policy in dealing with the defeated revolutionists weakened her influence on Egypt. According to Oriental ideas of justice Arabi and his fellow conspirators had justly forfeited their lives, whilst their sentence consisted merely in a mild form of banishment which was tempered by liberal pensions. Lord Dufferin was sent to Egypt to report on the condition of the country, and especially to answer the question how soon it would be safe to withdraw British control. He reported that the organization of Egyptian affairs was such that for the present at least it would be unsafe for the British to withdraw their guiding hand, but that it was possible within a few years that the country would be able to govern itself.

Internal Progress.—In spite of their insecurity of tenure the British officials did their best to improve the administration of the country. Progress was not rapid at first, and many mistakes were made, but soon beneficial effects of the British rule became apparent. For several years, however, it was thought that at any moment the ministry would leave Egypt to her fate. It was not until nearly the close of the last decade that it was realized that Great Britain had come to stay. For more than fifteen years Egypt has been virtually a British protectorate. It is an important question whether the condition of the country has improved under this system. Much light has been thrown on this question by the publication in the year 1898 of valuable statistical estimates by Sir Edwin Palmer, the financial adviser of the Khedive. The returns cover the period from 1892 to 1897, but as they were for the first time available in the spring of 1898 the discussion of them is appropriate to the present year.

In the first place, as to the increase of population. The population of Egypt from 1882 to 1897 rose from 7,000,000 to nearly 10,000,000, nor is this increase due to foreign emigration, since the number of foreigners has risen only some 20,000. The increase of population proves an improvement in the condition of the people, for it

means a falling off in infant mortality, better sanitary conditions and economic advancement. The area of taxable land in Egypt increased from 5,000,000 acres in 1882 to about 5,600,000 acres in 1897, that is, nearly three per cent. This improvement has made it possible to reduce the land tax without reducing the revenue. The arrears of the land tax have been paid off and the extortions practised by the Fellaheen have been abolished. Although the indirect taxes have not been increased they have yielded a far larger return on account of the increased consumption resulting from the improved condition of the mass of the people. The traffic returns on the railways increased from 1,300,000 pounds in 1881 to 2,000,000 pounds in 1897; the post-office receipts increased about fifty per cent. and the number of letters posted has nearly doubled. No doubt this is largely due to the fact that throughout this period Egypt has enjoyed peace and tranquillity, but this very fact is to be set down to the credit of the British control, for under the former style of government so long a period of quiet and good order was not to have been expected. There is no doubt that the financial condition of the country has been vastly improved under British direction. British officials have shown themselves competent, courageous and conscientious; they have done away with old abuses and administered affairs with honesty.

At first thoughts it is a matter of surprise that the railway mileage of Egypt during this period has increased to the extent of only 212 miles, but this is explained by the fact that in the settlement concluded between Egypt and her creditors, the state railways were virtually mortgaged for the payment of the public debt. Fifty-five per cent. of their gross receipts are applied to this purpose, so that the working expenses of the road must be made out of the forty-five per cent. that remains. But although mileage has not increased, the passenger traffic has grown enormously, rising in fifteen years from 3,000,000 to 9,500,000. In irrigation and the construction of drains both in lower and in upper Egypt the British authorities have made great advances. In education it cannot be said that any very radical changes have been effected, but if the extent of newspaper circulation is an indication of intellectual improvement in the masses, the signs of the times are hopeful, for the number of newspapers posted during the fifteen years in question has increased by about 5,000,000. British ideas of justice are incomprehensible to the Oriental mind, which dislikes technicalities and the observance of rules and would have the judge decide on principles of equity. The complex system of English law worries the native mind, and the improvement which has been made in the administration of justice may not have permanent effects. Nevertheless this progress has been considerable. British criminal justice is administered, and examination under torture and various other barbarous customs that prevailed before the occupation, have been abolished. As to the condition of the large cities also improvements have been made in the matter of buildings and in sanitary arrangements. The streets of Cairo have been widened and public works of many kinds have been successfully carried out.

The Alleged Results of British Occupation.—The Hon. Edward Dicey, to whom we are indebted for many of the foregoing facts, sums up the effect of the British rule in Egypt in the following paragraphs:

"To sum up, under our occupation Egypt has been rendered solvent and prosperous; taxes have been largely reduced; her population has increased by nearly 50 per cent.; the value and the productiveness of her soil has been greatly improved; a regular and permanent system of irrigation has been introduced into Lower Egypt, and is now in the course of introduction into Upper Egypt; trade and industry have made giant strides; the use of the Kurbash has been forbidden; the Corvée has been suppressed; regularity in the collection of taxes has been the rule, and not the exception; wholesale corruption has been abolished; the Fellaheen can now keep the money they earn, and are better off than they were before; the land-owners are all richer owing to the fresh supply of water, with the consequent rapid increase in the salable price of land; justice is administered with an approach to impartiality; barbarous punishments have been mitigated, if not abolished; and the extraordinary conversion of Cairo into a fair semblance of a civilized European capital has been repeated on a smaller scale in all the chief centres of Egypt. To put the matter briefly, if our occupation were to cease to-morrow, we should leave Egypt and the Egyptians far better off than they were when our occupation commenced.

"If, however, I am asked whether we have succeeded in the alleged aim of our policy, that of rendering Egypt fit for self-government, I should be obliged honestly to answer that in my opinion we have made little or no progress towards the achievement of this aim. The one certain result of our interference in the internal administration of Egypt has been to impair, if not to destroy, the authority of the Khedive; of the Mudirs, who, as the nominees of the Effendina, rule over the provinces; and of the Sheiks, who, in virtue of the favor of the Mudirs, govern the villages. We have undoubtedly trained a school of native officials who have learnt that it is to their interest to administer the country more or less in accordance with British ideas.

Here and there we may have converted an individual official to a genuine belief in these ideas. But I am convinced that if our troops were withdrawn, and our place in Egypt was not taken by any other civilized European Power, the old state of things would revive at once, and Egypt would be governed once more by the old system of Baksheesh and Kurbash. Indeed, the last state of the country would be worse than the first, as the old generation of Egyptian statesmen have fallen into the background under our occupation, and the younger generation have so far not exhibited the intelligence, or the vigor of their predecessors. The simple truth is that Egypt, in common with almost all, if not all, Oriental countries, has no desire for self-government; and that even if such a desire existed, self-government is not an art that can be taught by foreign supervision and control."

This view of the improving conditions of Egypt is borne out by the report of the United States official representative in that country. As an instance of the improvement in the condition of the masses the fact is cited that the land tax, which was formerly \$24.00 a feddah (about an acre) is now \$7.50, and that the bonds of the Suez Canal, the interest on which could not be paid in the time of Ismail Pasha, are now selling at 106 and over. It is estimated that since 1883 the average value of the crop has increased \$4,000,000 per annum. In 1898, 5,000,000 acres were said to be under cultivation. The railways are all government property with the exception of a short line near Alexandria and another between Port Said and Ismaila. In 1898, the railway mileage was 1,400. The management of the railway is entrusted to an administrative board, whose members consist of a chairman, who is an Englishman, and two others, who are respectively French and Egyptian. Concessions have been made to companies for the construction of light railways in several of the provinces. As to inland navigation, the traffic on the Nile and in the Delta is considerable. The roads have been improved and the use of vehicles is becoming more common. See COTTON AND THE COTTON INDUSTRY.

HISTORY.

The Soudan.—The Egyptian Soudan contains the following provinces: Dongola, Khartoum, Sawakin-Massawan, Kordofan, Darfur, Senaar, Equatorial Province, Fazocli, Bahr-el-Ghazal, Zeilah, Harrar, Berbera.

According to the *Statesman's Year Book* for 1898, the area was 950,000 square miles, and the population was 10,400,000, but these figures are probably based on loose estimates. Before the Mahdist rebellion the Egyptian Soudan was placed under a governor-general whose capital was Khartoum, but under the Mahdi and his successor the Khalifa, the Egyptian power waned and the region was divided into various districts under the control of the native rulers. British influence was acknowledged as extending over a great part of this territory by agreements concluded with Italy and Germany, but since the Mahdist revolt the country has declined in prosperity and population, and the Equatorial Province has sunk back into barbarism.

The Anglo-Egyptian Expedition.—Since 1896 the attention of the world has been attracted to the attempt of the British to restore their authority in this region and to reclaim it to civilization. In 1896 an expedition commanded by the Sirdar, Sir Herbert Kitchener, started southward along the Nile with the object of occupying the province of Dongola. It followed a novel plan, proceeding in a leisurely way up the river and completing railway and telegraph lines as it went. Gunboats and other vessels accompanied it along the river. The expedition was thoroughly successful, largely no doubt owing to this method of progress. The Dervishes offered little resistance and the Egyptian forces having seized Dongola, September 23, 1896, regained control of the entire province. Throughout 1897 the advance continued, the Dervishes retiring before the invaders, and the country was occupied as far as Berber. This city as well as Abou Hamed was occupied. Reinforcements were sent to the expedition. Care was taken to keep the railroads open in the rear, so that new troops and supplies could arrive when needed.

Battle of the Atbara.—As the troops advanced up the Nile the Dervishes crossed the river at Shendy and marched upward as if for the purpose of meeting the British and Egyptian troops at Berber, but in the meanwhile the gunboats captured Shendy and cut off the supplies of the Dervishes. The latter, 20,000 strong, occupied an entrenched position at the junction of the Atbara river, and the Nile. At day-break of the morning of Friday, April 8, 1898, General Kitchener in command of some 13,000 troops, of whom all but a few battalions were Egyptians, attacked the enemy's position and drove them from the field inflicting a loss of some 2,000 men. The British loss was slight. Among the British troops there were but few casualties, but the Egyptians lost fifty or sixty men killed and between three and four hundred wounded. The leader of the Dervishes, Emir Mahmoud, was captured. Osman Digna, however, who commanded another body of the Dervishes, managed to escape. The severe losses of the Dervishes were due largely to the effective work of the Maxim guns with which the British forces were equipped.

Battle of Omdurman.—The marvellous precision of General Kitchener's movements

had made it possible to know distinctly beforehand what would occur and to know it almost to the date. It was prophesied long beforehand that before the middle of September the Khalifa's power would be overthrown, Gordon avenged and Omdurman taken. So it turned out. General Kitchener himself is said to have miscalculated the time of the vital and decisive battle by only one day. The army of occupation continued to advance steadily up the river driving the Dervish scouts before them until within eight miles of Omdurman. The invading army was drawn up in a line about four miles long with the English troops on the right and centre, the Soudanese on the left, and the Egyptians as reserves. It was not expected that the Dervishes would begin the attack so early, but General Kitchener was prepared for that or for any other event. The Dervishes attacked the English flank with the same bravery as they had shown at Atbara. They were mowed down in vast numbers by the Maxim guns, and yet they returned to the attack again and again. Then they attacked the left but were repulsed, and upon the arrival of the Egyptian reserves they were driven back in confusion. The fighting lasted until sundown. The Khalifa and Osman Digna then fled with the English cavalry in hot pursuit. On September 7 General Kitchener notified the War Department that his officers had counted 10,800 dead Dervishes, that the wounded were estimated at 16,000 and the prisoners between 3,000 and 4,000. The English and Egyptian losses were reported as 46 killed and 333 wounded. Omdurman was occupied by the British. This city, it will be remembered, was the Mahdi's capital after Khartoum was destroyed, the stones of the latter being used in the construction of the new town. It is just across the river from Khartoum and has become a large and thriving city. The British also occupied Khartoum where a memorial service was held in honor of General Gordon. The companions of Gordon had for the most part been killed. Some white prisoners, however, were found by the British. Among them was Karl Neufeld who had been for many years a captive and had undergone every kind of humiliation and hardship. General Kitchener's success was made easier by the fact that the Khalifa, the Mahdi's successor, was a tyrannical ruler and there was little disposition on the part of the people to take up arms on his behalf. One remarkable feature of the battle was the charge of the Twenty-first Lancers, who finding themselves wholly surrounded by the enemy, hacked their way through a greatly superior force. Although many chose to speak triumphantly of this victory as avenging Gordon, the expedition must be regarded as undertaken for better motives than revenge. The reconquest of the Soudan was certainly for the benefit of civilization. The seizure of these provinces by the Mahdists shut off a prosperous and promising country containing some 12,000,000 of people from all improving influences. Under the rule of Mahdism the country was desolated, agriculture and trade died out and it is said the population was reduced nearly one-half. The admirable management of the Kitchener campaign attracted attention all over the world. In the United States it occasioned in some quarters remarks on the contrast which it presented to the alleged mismanagement of the United States forces in the war with Spain. Certainly the charges of nepotism and political jobbery which were heard in regard to the latter war had no parallel in the case of the Kitchener expedition. It was efficiently officered; the troops were well cared for; everything was provided at the right time and the campaign was conducted as smoothly and precisely as if it had been rehearsed a dozen times beforehand. The comparison, however, is most unfair because the Anglo-Egyptian expedition had been planned for a long time and there was no such haste needed in carrying it out. It must be remembered also that previous British expeditions had failed and that the good sense shown in this case was in part the result of bitter experience.

The French at Fashoda.—Hardly had Gen. Kitchener won the battle of Omdurman and occupied the adjacent city of Khartoum, when news was brought by the captain of one of the Khalifa's steamers that Fashoda, some 350 miles further up the Nile, was occupied by a white force. It was at once supposed that this force was that of Major Marchand, which had been pushing toward the Nile from the French Congo (q. v.). This conjecture proved to be correct, when Gen. Kitchener, having sent the press correspondents all to the rear, reached Fashoda on September 19. Major Marchand with a small force was in possession and had hoisted the French flag and when General Kitchener demanded that he should withdraw, Major Marchand refused to do so without orders from his government. He said that he had been directed by the French government to occupy the district of the Bahr-el-Ghazal and the country on the left bank of the Nile as far as Fashoda; moreover, that he had made a treaty with the native chiefs of the latter region and that this treaty had been sent to his government for ratification. General Kitchener formally protested against the occupation and reminded Major Marchand that with their scanty ammunition and supplies his small following would have been cut to pieces by the Dervishes had it not been for the British victory. Alarm was felt in political circles when the rumor of this affair was spread. It was represented that Major Marchand would not withdraw and that France intended to retain Fashoda. It was therefore believed that a con-

25°

Longitude 30° East from Greenwich

35°

EGYPTIAN SUDAN.

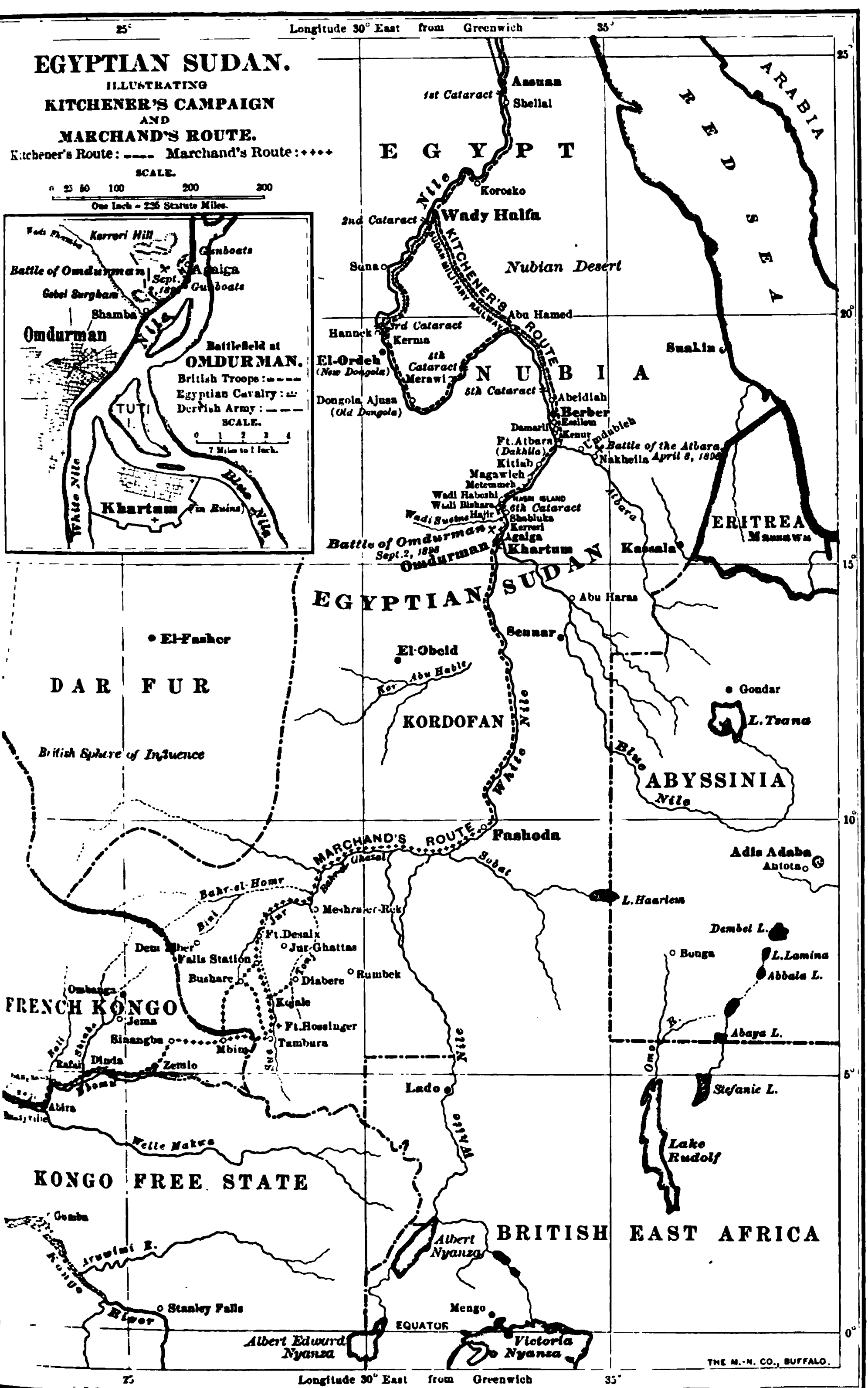
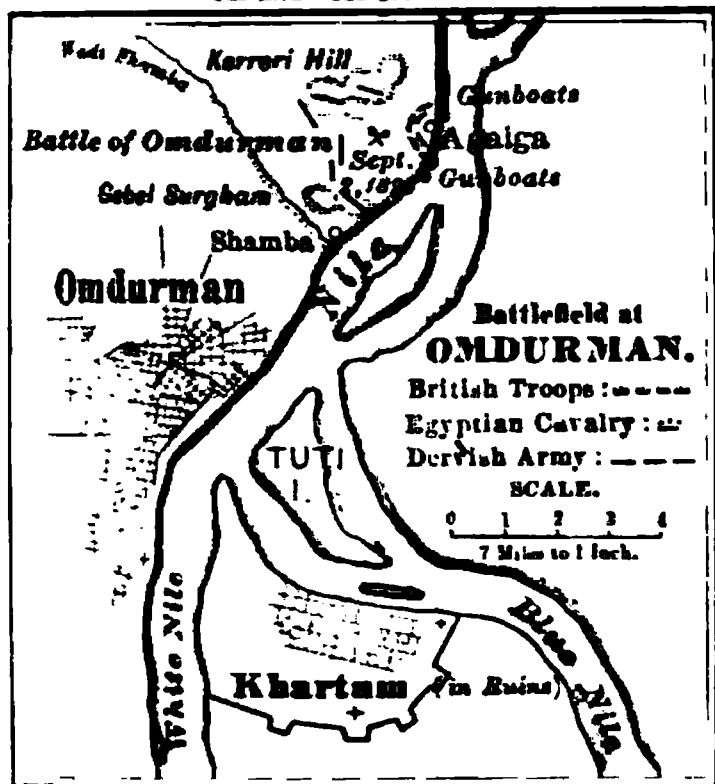
ILLUSTRATING
KITCHENER'S CAMPAIGN
AND
MARCHAND'S ROUTE.

Kitchener's Route: ——— Marchand's Route: + + + +

SCALE.

0 25 50 100 200 300

One Inch = 25 Statute Miles.



THE M.-N. CO., BUFFALO.

fact would take place between the British troops and the members of Marchand's expedition and that France and England would be involved in war. For an account of the diplomatic complications and the discussion in the press to which this affair gave rise, see the articles GREAT BRITAIN and FRANCE (paragraphs on History). It is sufficient here to state that the French government transmitted a message to Marchand directing him to send a report as to what had happened. The report had already been sent but Major Marchand decided to return to France himself. He reached Cairo on November 3. Two days later it was announced by Lord Salisbury that the French government had decided to withdraw their forces from Fashoda. Further comment on Kitchener's victory and the discussion of the British policy in Egypt will be found in the articles to which reference has been made. For an account of archaeological explorations in Egypt, see the article ARCHÆOLOGY.

ELCHE, BUST FROM. See ARCHÆOLOGY and SCULPTURE.

ELECTRICAL ENGINEERING IN THE UNITED STATES (1898). The capital invested in the various electrical industries in the United States at the present time is estimated at about \$1,900,000,000, of which a fair proportion is devoted to manufacturing industries. Electric generators up to 4,600 kilowatts (6,100 horsepower) capacity are now produced at about 2 cents per watt output, whereas in 1882 the cost was 20 cents per watt. In the same way weights have been reduced, and where in 1884, 6 watts output was produced per pound now 10 watts per pound are obtained.

Formerly the cost of generating a kilowatt hour of electric energy by steam was somewhere near 7.5 cents; at the present energy produced in the same way for street railway purposes costs only about one cent per kilowatt hour. Electricity obtained from water power is still cheaper, and in the case of the Niagara Falls plant is furnished to customers in Buffalo as low as $\frac{2}{3}$ of a cent per kilowatt hour, delivered. The cost of incandescent lamp bulbs has been reduced from \$1.00 for a 16 candle power lamp to 18 cents; and while the maximum attainable candle power under commercial conditions was 0.20 candle power per watt we now obtain 0.25 candle power per watt.

Voltages for incandescent work have increased from 110 to 220, and even 500 volts. Incandescent arc lamps have come into quite general use, and the present forms of enclosed lamp, in which the carbons are in a nearly air-tight globe, burn from 100 to 150 hours with one trimming, where formerly 16 hours was the usual limit; carbons for these lamps have decreased in cost from 6 to 2 cents apiece. It is estimated that fully \$600,000,000 is at the present time invested in electric lighting stations in the United States.

A few years back accumulators or storage batteries were limited to 3.4 watt hours per pound of electrodes, with an energy efficiency of about 69 per cent. when discharged at a current density of 12 amperes per square foot of negative plate surface. The present figures are from 5 to 6 watt-hours per pound of storage cell, and an energy efficiency of 85 per cent. when discharged at a current density of 4.8 amperes per square foot of negative plate surface. The total capacity of storage battery plants in the United States is estimated at about 56,000,000 watt-hours. The efficiency and materials used in street car motor work have been greatly improved, and to-day the output of these motors is 14 watts per pound of motor, where formerly 5 watts per pound was the limit. The 14,000 miles of electric railway track of the country represent an investment, including all related departments, of about \$100,000,000, and give employment to 170,000 men.

Electric transmission of energy now includes plants aggregating an output of over 30,000 kilowatt, or about 200,000 horse-power. Alternating current apparatus, such as generators, motors and transformers, have been greatly improved; and in the latter case outputs of 100 watts per pound of material are now obtained. In telegraphy recent returns indicate that there are in the United States 1,000,000 miles of telegraph wire, calling for 200,000 miles of pole line, with 25,000 offices. The capital invested is estimated at \$150,000,000.

Telephony has received a wonderful impetus; and it is not uncommon to carry on conversations over distances up to 1,500 or 1,800 miles. All told there are about 1,000,000 telephones in use, with 400,000 stations, and 900,000 miles of wire. It is estimated that 17,000 persons are engaged in central stations, and that they daily make 3,000,000 connections. The capital invested in this industry is close to \$100,000,000. Practically all city lines are now underground, and it is estimated that 100,000 miles of this character of lines have been installed in the last few years.

Electro-chemical processes of producing aluminum, sodium and other alkalies are rapidly increasing; and the past year saw 150,000 tons of material produced in this way.

ELECTRICITY ON SHIPBOARD. The use of electricity on board vessels, either naval or merchantmen, except for certain special details, is identical with its

use on land. Its use in any one case is naturally limited, and the equipment of each vessel, no matter how large or small, is complete in itself. Its introduction into all classes of marine service has been rapid and most satisfactory, and to-day there is no vessel, from a small cruising yacht to a battleship or great ocean liner, which is without an electrical equipment. These are duplicated in part to avoid the possibility of a shut-down, which in the case of ocean liners or warships might mean great inconvenience and danger.

Marine isolated plants include high-speed steam engines directly connected with compact direct current generators wound for voltages varying in different cases from 50 to 80 volts in the naval, to from 50 to 110 in the merchant service. Engines and generators are most carefully designed, and as a rule are capable of very heavy overload to accommodate electric winches, etc.

Current is taken from the generators to the switchboard and thence to all parts of the vessel where needed, in feeders which are usually well insulated and protected in iron pipes, owing to the very destructive effect of salt water. On warships there are two circuits, the lighting and the battery or machine operating, the latter serving only when the vessel is in action. Owing to the corrosive action of salt water and ocean air, unusual precautions are taken with switches, lamps and other fixtures.

Besides the ordinary use for lighting, the ease with which wires possessing no heat, which will not freeze, and in which there is no danger, can be led about, and the compact form and adaptability of electric motors, have caused their use for operating blowers for ventilating purposes, portable pumps and tools, deck hoists, ice and refrigerating machinery, and for opening and closing waterweight doors, etc., functions which formerly belonged to compressed air, hydraulic, or steam motors. More recently on warships electricity has been adopted to operate ammunition hoists, turn turrets, handle heavy guns and torpedo-discharging apparatus. Experience has shown that for ventilating purposes the electric motor directly connected to the fan is by all odds the best means, since they can be put in corners and out-of-the-way places, and require no hot steam and exhaust pipes. For rapid repairs portable motors are of great service. Portable pumps are also used. Deck winches and derricks for loading and unloading are now replacing the old style steam winch.

Other uses are the telephones and engine signals; and these are extensively used in both naval and merchant service. The experience on the United States vessels with these and other delicate devices, during the recent war with Spain, has raised a serious question as to their value in the navy. It was found that the telephones were too delicate, and that the shock due to the recoil of the large guns soon threw them out of order. In the same way the range finders and firing signals, proved of questionable value. However, the search-light, electric ammunition hoists, ventilators and electric turret moving equipments made a most excellent showing.

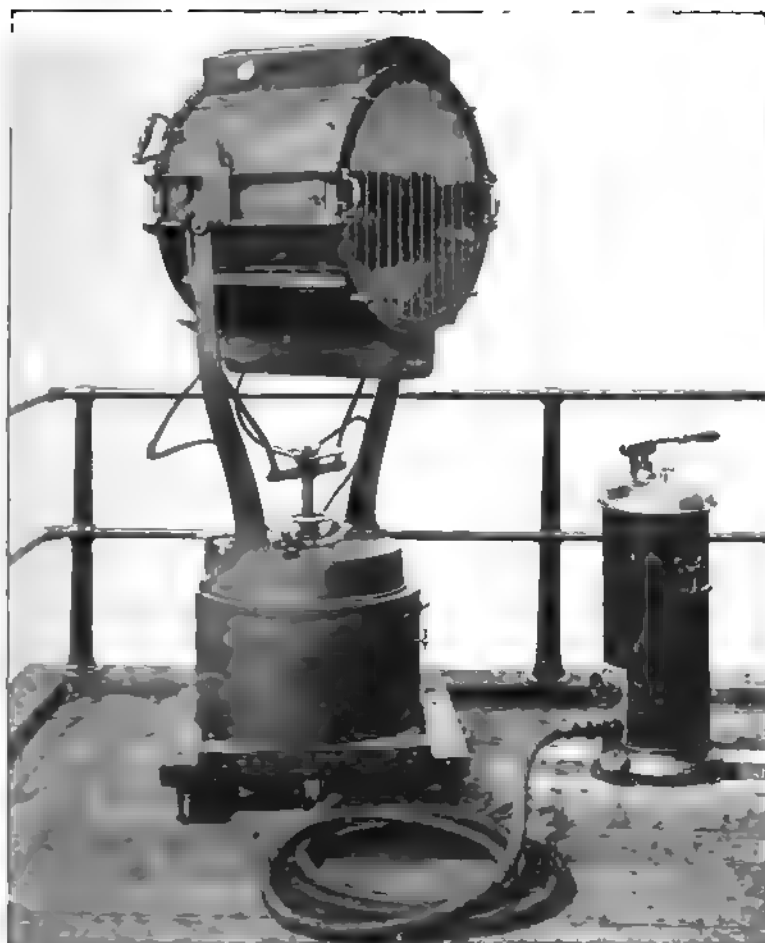
In the merchant marine, where the conditions are not so exacting, electricity has been used with great success for all the purposes outlined. An example of the way ships of to-day are equipped is afforded by the *Grand Duchesse* of the Plant Line, which runs between New York and the Southern ports of the United States.

In the engine room are two 20 kilowatt generators, and a complete switchboard with 16 main circuits, 10 of which lead to small switchboard; in various parts of the ship to which are connected branch circuits, none with more than 8 lights. The other circuits, are for power and special purposes, such as the searchlight and coal conveyors. The latter are operated by two 12 kilowatt motors, and consist of conveyor buckets for loading, and a coal trimming device. This has a capacity of a ton per minute. The valve of the steam steering engine is operated by a telemotor, which is in turn controlled by a switch in the pilot house, which also contains a helm indicator, a device for showing the position of the rudder. A system of lights on the inside of the roof of the pilot house is so connected to the various signal lights that when any one of them burns out or goes out the corresponding light on the roof is switched in and a buzzer begins to hum. An annunciator near at hand is connected with 14 thermostats distributed throughout the cargo space of the ship to give warning of fire. There is also a telephone system, with a central station, and 150 instruments.

ELECTRIC CARRIAGE. See AUTOMOBILE.

ELECTRICITY AS AN ANÆSTHETIC. See ANÆSTHESIA and PSYCHOLOGY, EXPERIMENTAL (paragraph Yale University).

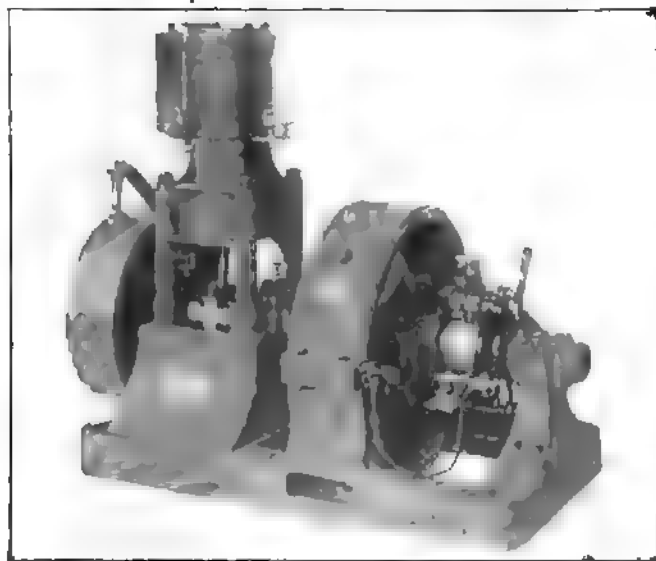
ELECTRIC LIGHT AND POWER STATIONS. The increasing use of electricity for lighting and power purposes during the past two years, has been a direct result of certain changes in the method of producing current. In the older stations installed several years ago, small high-speed engines non-condensing were either belted to small high-speed low voltage generators, or large slow-speed engines were used to drive long and heavy countershafts or jackshafts from which belts were run to the same type of small generator. This system has been abandoned in favor of the



1



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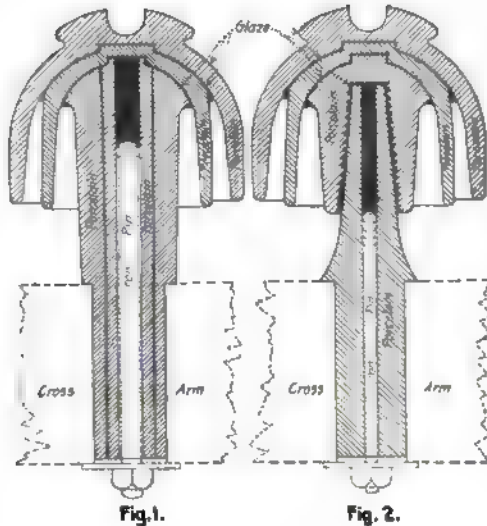
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ELECTRICITY ON SHIPBOARD.—1. Marine search-light. 2. Marine electric arc lamp.
3. Marine electric generating set. Steam engine and generator directly connected.

(General Electric Co.)

better method of directly connecting large slow-speed compound or triple expansion condensing engines to large generators. This reduces the number of units and enables a considerable saving to be made in the operation of the station owing to the higher efficiency of these larger engines and generators. The accompanying table affords an idea of the electric lighting industry. The consolidation of various electric lighting, railway and power companies in various parts of the country, has also permitted the construction of larger and larger stations into which have been introduced all manner of labor saving machines, such as economizers, feed water heaters, coal and ash conveyors, etc. Besides the steam operated plants, a number of hydro-electric or hydraulic plants have been installed. One of this type—The Hudson River Power Co., at Mechanicsville, N. Y.,—is described further on in this article. These hydraulic plants are rapidly being introduced whenever sufficient water power can be obtained. They find their principal use in the western part of the United States and in Switzerland. In practically all of the recently installed power plants and many of the lighting systems, poly-phase alternating current is generated at workable voltages from 500 to 1,000, and is transformed by means of either static or rotary transformers to voltages as high as from 10,000 to 33,000 volts. In this form it is transmitted to sub-stations, where by means of transformers, converters, the pressure is reduced to a safe and convenient value. Indications are that there will be a gradual increase in the voltages, and consequently the length of transmission lines. An example of a lighting station operated in this way is afforded by the Edison Electric Illuminating Co. of Brooklyn, N. Y., where the generating station or Union Station is at Bay Ridge, N. Y. This main station is 206x120 ft. of brick and iron construction with an ultimate capacity of 60,000 horse-power. It contains at present one 3,000 horse power McIntosh & Seymour steam engine directly coupled to a 2,000 kilowatt General Electric generator; a 1,500 horse-power Hamilton Corliss engine and a 1,000 kilowatt three-phase generator and a 300 horse-power engine of the same make. Three-phase current is generated at 6,600 volts, 25 cycles, and is transmitted over cables in suitable underground conduits to 3 large stations containing engines and generators, and 7 sub-stations. In these are located transformers, which reduce the pressure to that suitable to operate induction motors which are connected to arc light generators for street lights, and direct low tension machines for incandescent lighting in stores and houses, and for charging the storage batteries with which each station is equipped. The total capacity of the system on Jan. 1, 1898, was 103,591 16 candle-power incandescent lamps, 4,032 low tension arc lamps, 3,702 horse-power of motors and 1,939 high tension arc lamps. In all some 30 miles of triple conductor or 90 miles of cables are used in the distribution from the central station.

An example of an hydraulic station and transmission plant is afforded by the Hudson River Power Co., Mechanicsville, N. Y. This plant includes a main dam of concrete—16 ft. high, 8 ft. thick at the crest, 16 ft. thick at the base, and 800 ft. long; connecting two concrete abutments, the eastern one being 20 ft. long, 26 ft. high, 16 ft. thick at the top and 34 ft. thick at the base; the western one being 257½ ft. long upon which is built the power house. In this portion are built 7 chambers—5 of which contain double 42 in. turbine each pair of 1,000 horse-power which connect to 5 three-phase generators of 750 kilowatts each, of the revolving field stationary armature type. Each of these generates alternating current of 36 amperes at 12,000 volts at a periodicity of 38. The current is carried to a large and well arranged switchboard from which the feeder circuit are controlled. These are three 210,000 B. & S. bare copper wires running to the great works of the General Electric Co. at Schenectady, N. Y., where transforming machinery drop the pressure and change the form of the current to that suitable for operating the immense factory of the company.



Sectional Views of Insulators for High Tension Electric Transmission.

Central Electric Lighting Stations in United States owned and operated by Private Corporations, Firms and Individuals.

(Taken from the American Electrical Directory, September 30, 1898.)

STATE.	Number of Central Stations.	Capital Stock.	NUMBER OF ARC LIGHTS.			NUMBER OF INCANDESCENT LIGHTS.			Engine Horse Power.
			Series.	D. C. Inc.	A. C. Inc.	Total.	Direct.	Alter-nating.	Total.
Alabama.....	21	\$1,755,700	2,634	68	49	2,751	7,665	21,810	29,475
Arizona.....	6	560,000	143	8	.....	151	1,900	7,000	8,900
Arkansas.....	20	1,282,900	901	111	81	1,093	9,185	14,265	23,450
California.....	74	17,368,000	9,808	127	303	10,236	107,210	152,960	260,070
Colorado.....	46	19,695,500	3,576	64	55	3,695	44,340	105,665	149,955
Connecticut.....	34	4,685,500	5,054	198	16	5,268	26,175	84,790	120,965
Delaware.....	1	250,000	200	.....	.....	200	12,500	10,000	22,500
District of Columbia.....	2	1,525,000	550	.....	.....	550	20,000	1,200	21,200
Florida.....	14	531,000	1,125	1	106	1,232	2,050	15,500	17,550
Georgia.....	28	2,045,500	2,692	16	816	3,014	4,000	54,350	58,350
Idaho.....	12	330,000	297	.....	8	300	5,600	5,745	11,345
Illinois.....	210	14,424,550	14,238	4,274	433	18,965	299,485	431,838	781,308
Indiana.....	101	6,075,550	9,604	39	151	9,794	39,990	149,790	189,770
Indian Territory.....	1	10,000	.....	30	.....	30	1,000	.....	1,000
Iowa.....	110	6,600,500	4,817	371	166	5,354	49,385	149,678	199,063
Kansas.....	58	3,107,000	3,233	234	30	3,497	28,515	61,150	89,665
Kentucky.....	38	2,079,800	3,112	10	74	3,196	3,985	98,615	97,550
Louisiana.....	7	900,725	2,380	2	.....	2,382	180	43,080	44,080
Maine.....	39	2,246,600	2,310	10	5	2,325	20,960	67,466	88,426
Maryland.....	25	3,987,000	4,463	148	15	4,636	9,800	69,900	79,700
Massachusetts.....	110	17,749,000	24,235	1,588	154	25,977	212,175	509,959	722,134
Michigan.....	106	6,019,575	8,241	1,023	292	9,561	107,453	224,345	331,808
Minnesota.....	42	4,824,000	4,380	344	13	4,737	51,895	96,690	150,545
Mississippi.....	13	1,758,500	620	12	10	642	2,100	14,450	16,550
Missouri.....	73	9,449,500	7,872	37	915	8,824	18,350	230,310	238,660
Montana.....	17	3,131,000	1,415	75	14	1,504	5,300	64,425	69,725
Nebraska.....	37	3,084,250	1,435	40	73	1,597	6,550	43,515	50,065
Nevada.....	3	310,000	185	.....	.....	185	.....	1,050	1,050
New Hampshire.....	41	3,082,500	3,070	40	21	3,131	12,940	91,020	103,960
New Jersey.....	61	6,576,450	9,115	79	136	9,380	55,775	155,280	211,055
New Mexico.....	5	400,000	62	.....	.....	62	1,000	4,400	5,400
New York.....	196	40,125,000	33,447	5,979	3,685	43,111	594,310	614,130	1,178,440
North Carolina.....	18	853,100	815	13	.....	828	5,905	18,850	19,755
North Dakota.....	7	425,000	110	22	.....	132	3,450	6,800	10,050
Ohio.....	182	11,423,000	17,215	833	235	18,322	130,980	194,505	325,485
Oklahoma Territory.....	4	230,000	190	.....	20	210	5,490	650	6,140
Oregon.....	27	4,560,000	1,391	14	14	1,919	4,670	43,325	47,995
Pennsylvania.....	215	17,967,135	29,219	1,473	623	31,335	275,235	545,290	840,495
Rhode Island.....	13	3,084,500	5,090	73	4	5,142	13,170	60,220	79,390
South Carolina.....	13	471,000	605	12	87	5,704	1,050	14,100	15,150

Central Electric Lighting Stations in United States—Continued.

STATE.	Number of Central Stations.	Capital Stock.	NUMBER OF ARC LIGHTS.				NUMBER OF INCANDESCENT LIGHTS.			Engine Horse Power.
			Series.	D.C.Inc.	A.C.Inc.	Total.	Direct.	Alternating.	Total.	
South Dakota	16	\$630,500	380	2	15	877	5,550	12,800	18,350	18,350
Tennessee	23	1,247,210	2,120	11	110	2,241	655	75,230	75,885	9,730
Texas	67	4,650,400	2,887	72	95	3,054	19,353	98,455	117,808	18,175
Utah	8	751,000	910	.....	50	960	1,150	14,600	15,750	4,080
Vermont	24	803,300	1,230	20	24	1,274	5,080	46,440	51,520	7,980
Virginia	28	1,261,500	2,087	92	63	2,237	18,100	21,995	40,095	7,850
Washington	30	3,887,800	2,335	55	10	2,400	25,235	33,100	58,335	9,855
West Virginia	27	1,032,600	680	25	21	736	7,140	36,900	44,040	5,810
Wisconsin	86	6,191,275	5,368	269	105	6,243	39,065	118,160	157,225	26,635
Wyoming	8	297,100	255	20	.....	275	9,250	8,975	18,225	1,590
Totals.	2,275	\$246,319,610	239,089	17,973	8,636	265,708	2,812,221	4,968,231	7,220,452	994,688

Central Electric Lighting Stations in United States owned and operated
by Municipalities.

STATE.	Number of Central Stations.	NUMBER OF ARC LIGHTS.				NUMBER OF INCANDESCENT LIGHTS.			Engine Horse Power.
		Series.	D. C. Inc.	A. C. Inc.	Total.	Direct.	Alter- nating.	Total.	
Alabama.....	2	.....	.....	.....	.....	.....	900	900	180
Arkansas.....	2	215	.....	.....	215	.....	300	300	336
California.....	4	250	.....	.....	250	.....	3,400	3,400	565
Colorado.....	1	.....	.....	.....	.....	.....	300	300	80
Connecticut.....	1	101	20	.....	121	2,000	.....	2,000	280
Delaware.....	4	.....	6	5	11	4,000	900	4,900	440
Florida.....	2	270	.....	.....	270	.....	9,000	9,000	680
Georgia.....	8	855	.....	3	858	.....	6,750	6,750	865
Illinois.....	84	3,544	.....	5	3,549	5,440	15,530	20,970	5,080
Indiana.....	18	1,475	.....	.....	1,475	600	18,930	19,530	4,285
Iowa.....	23	178	63	82	321	16,600	12,750	30,350	3,500
Kansas.....	4	70	.....	.....	70	.....	1,300	1,300	230
Kentucky.....	5	410	.....	.....	410	.....	1,100	1,100	680
Louisiana.....	1	.....	.....	8	8	.....	2,000	2,000	200
Maine.....	2	230	.....	.....	230	.....	6,000	6,000	4,025
Maryland.....	1	76	.....	12	76	.....	.....	.....	85
Massachusetts...	11	1,728	.....	63	1,738	.....	25,000	25,000	4,455
Michigan.....	35	3,386	48	27	3,697	5,475	42,550	48,025	9,070
Minnesota.....	25	659	81	5	767	12,200	16,440	28,640	3,120
Mississippi.....	1	30	.....	29	35	.....	1,800	1,800	330
Missouri.....	20	1,015	37	.....	1,061	2,150	30,720	32,870	3,185
Montana.....	1	64	.....	.....	64	.....	1,550	1,550	175
Nebraska...	7	165	20	.....	185	2,120	3,300	5,420	685
New Hampshire..	1	.....	.....	.....	.....	.....	1,040	1,040	65
New Jersey.....	3	120	.....	.....	120	.....	3,080	3,080	900
New York.....	14	3,615	.....	49	3,664	200	18,750	18,950	4,145
North Carolina..	5	180	1	2	183	1,350	2,510	3,860	415
Ohio.....	41	2,587	162	105	2,854	3,080	40,355	43,385	7,985
Oregon.....	2	.....	.....	.....	.....	175	600	775	105
Pennsylvania....	18	1,955	5	.....	1,960	1,963	15,050	17,013	4,280
South Dakota....	1	.....	.....	7	7	.....	800	800	80
Tennessee.....	8	135	28	1	164	1,000	2,615	3,615	685
Texas.....	7	500	.....	.....	500	1,310	3,390	4,670	1,100
Utah.....	2	15	.....	.....	15	50	500	550	190
Vermont.....	8	80	.....	.....	80	.....	16,000	16,000	2,825
Virginia.....	8	485	.....	.....	485	563	2,300	2,863	850
Washington.....	5	714	8	.....	722	1,350	5,950	7,300	1,480
West Virginia....	1	470	.....	.....	470	.....	.....	.....	500
Wisconsin.....	4	.....	.....	30	30	100	3,450	3,550	360
Totals.....	334	25,273	479	433	26,185	61,695	317,970	379,665	69,145

ELECTRIC LIGHTING. See GARBAGE.

ELECTRIC RAILWAY. Within the past two years the conduit electric railway has received considerable attention as a result of the successful operation of the experimental lines in New York City and in Washington, D. C., installed in 1895. The indications are that the trolley roads will be abandoned in favor of the conduit system, at least in the large cities. Cable railways have seen their day and are being converted to conduit electric systems. The accompanying table affords an idea of the extent to which electric railways have been adopted in the United States.

Far too many railway systems were installed during the year to attempt to describe all in this article. It will suffice therefore to describe certain typical roads.

Hoboken Shore Ry.—This was opened on Jan. 4, 1898. It extends about two miles along the Hudson River from Hoboken to Weehawken, N. J., and connects the wharves and docks. It is an electric road used for freight handling and the switching of cars to and from warehouses. The electric locomotives were built by the General Electric Co., Schenectady, N. Y., and have the following dimensions: length over all 29 ft., width 8 ft., height 13 ft., distance—centre to centre of trucks, $12\frac{1}{3}$ ft. There are two 4-wheel trucks each having two 85 horse-power motors giving a total of 540 horse-power or a draw bar pull of 10,000 lbs. at a speed of 8 miles per hour when fully loaded. The locomotive weighs 57,000 lbs. and has a 3 horse-power motor and compressor for air valves and whistle. The usual railway voltage of 500 is employed.

The Chicago and Milwaukee Ry.—This extends a distance of 31 miles from Evanston, Ill. to Waukegan, Ill. passing through 15 suburban towns, having a population of about 75,000. It is parallel and close to the shore of Lake Michigan. It is single track, but will be doubled in the near future. The track is of 65-72 lb. rails and 85 lb. girder sections, all 60 ft. long, with oak ties laid in broken stone and slag ballast 18 in. centre to centre. Overhead trolley of number 00. B. & S. copper is used with feeders running from sub-stations distributed along the line. The power station is centrally located, and will ultimately contain 2,000 horse-power in 3 horizontal engines and 8 boilers and 5—250 kilowatts, 5,000 volt three-phase generators. Feeders radiate from this station to the several sub-stations in which transformers and rotary converters will transform the current direct and reduce the voltage to 500 volts. The sub-stations will also contain storage batteries for a reserve as well as to help at times of heavy load.

Buffalo and Lockport Ry. Co.—This company was organized in April 1898 and operates 29 miles of track, feeding the Erie R. R. and connecting Tonawanda, Lockport and Buffalo, N. Y. It employs heavy overhead construction of the usual type, 500 volts. For passenger traffic there are 10 electric motor cars of from 20 to 25 tons weight equipped with 4 motors, each car with a total power of 208 horse-power. These are run on a half-hour headway. For freight service, two 36 ton electric locomotives capable of handling a 340 ton train at about 15 miles per hour are employed. These have the following dimensions: Length over all 32 ft., height of cab over rail 12 ft., distance between centre of trucks 13 ft., wheel base (1 truck) 6 ft., gauge 4 ft. $8\frac{1}{2}$ inches, diameter of wheels 36 inches, number of motors 4, horse-power of each motor 160. Draw bar pull at full load and speed 3,400 lbs. Current for operating the road is taken from the Niagara Falls power over a substantial transmission line of three No. 0000. B. & S. bare copper conductors at 10,500 volts to Lockport, N. Y., where a sub-station containing 6—150 kilowatts air-blast transformers and two 400 kilowatt, 500 revolutions rotary converters drop pressure from 10,500 alternating to 500 volts direct current at which it is fed to the trolley lines over suitable feeder circuits.

The Zermatt-Gornergrat Electric Rack Ry.—This road is 5.6 miles long, and starting from Zermatt, Switzerland, it ascends 5,248 ft. in its length of 5.6 miles, to the summit of Gornergrat, which has an elevation of 10,286 ft. above sea level. The road employs the "Abt" rack system with overhead trolley. Trains consist of an electric locomotive and two carriages seating 110 passengers, and weigh all told 63,800 lbs. and require 180 horse-power to move them up the steep grade which is 20 per cent. at a rate of 4.34 miles per hour. The road includes a steel arch viaduct 394 ft. long resting on two masonry piers 151 and 171 ft. high. Power is obtained from the Findelenbach river, a head of 333 ft. being secured. Water is led 656 ft. in a canal cut in the rock and in a steel pipe line 2.95 ft. in diameter and 656 ft. long with an incline of 30° . The power house includes three 250 horse-power horizontal turbines with a speed of 400 revolutions per minute direct connected to 5,400 volt three-phase generators. Current is carried over a suitable transmission line to the two sub-stations. In these and the central station are transformers dropping the pressure to 540 volts at which it is fed to the two trolley wires.

The Jungfrau Electric Railway.—This is an electric road extending to the top of the Jungfrau peak, the highest of the Jungfrau group of the Swiss mountains. The road starts from Little Scheidigg at an elevation of 7,000 ft., and by means of a succession of tunnels and an elevator passes up to the top of the Jungfrau peak which has an elevation of 13,670 ft. above the sea level. There are 5 stations, including the Observation House on the peak, which are formed by running the tunnel close to the precipitous mountain side and cutting windows through to the outside thus affording ventilation and a magnificent view. The tunnel has a total length of 6.7 miles with a section of 150.6 sq. ft. Most of the distance it will be unlined, but in parts where the rock is uncertain, a heavy masonry lining will be built. The train consisting of one car holding 40 persons will be propelled by an electric locomotive having a heavy gear engaging a rack placed between the track. Current for opera-

ting will be generated at Lauterbrunnen, $4\frac{1}{2}$ miles from the entrance, where a hydraulic power plant has been installed. Three-phase current is generated at this station and transmitted to sub-stations distributed along inside the tunnel where transformers and rotary converters will drop the pressure to 500 volts direct current, at which pressure it will be fed to the trolley lines to operate the locomotives.



Sketch showing location of Jungfrau Electric Railway.

It is estimated that the total cost will be \$1,930,000 and that 10,000 passengers will be carried the first year. The fare has been limited by legislation to \$8.68 for the round trip. It is understood, however, that only \$6.75 will be charged.

The following table gives the elevation of the different stations and the distances between them:

Distances between stations, elevation and gradients of the Jungfrau railway.

STATION.	Height. Station to Station.	Feet above sea level.	Distance. Station to Station.	Miles from start.	Maximum gradient per cent.
Little Scheidegg.....	.....	6,770	.....	.....	.....
Eiger Glacier.....	840	7,610	1.2	1.2	25
Eiger Wand.....	1,610	9,220	0.9	2.1	25
Ebnedal.....	1,140	10,360	1.5	3.6	25
Jungfraujoch.....	860	11,240	2.6	6.2	61
Elevators.....	2,330	13,490	1.7	7.9	25
Summit.....	240	13,670	.....	7.9	Vertical.

The following table gives comparative figures for three types of American electric locomotives.

SERVICE.	London-Central— Rapid Transit.		Baltimore & Ohio— Heavy Freight and Passenger.		Hoboken Shore R. R. — Switching	
	Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
Length.....	30	.....	35	.....	29	.....
Width.....	7	8	9	6 1/2	8	.....
Height.....	9	4 1/2	14	8	12	.....
Wheel base (rigid).....	5	8	6	10	5	6
Wheel base, total.....	30	4	.....	.....	12	3
Wheels, diameter.....	3	6	5	2	3	3
Motors, number.....	4	.....	4	.....	4	.....
Horse power, total.....	800	.....	1,200	.....	540	.....
Speed mile per hour.....	27	.....	12-30	.....	8	.....
Weight, lbs.....	84,000	.....	162,000	.....	67,000	.....
Rated tons.....	105	.....	1,300-1,900	.....	295	.....

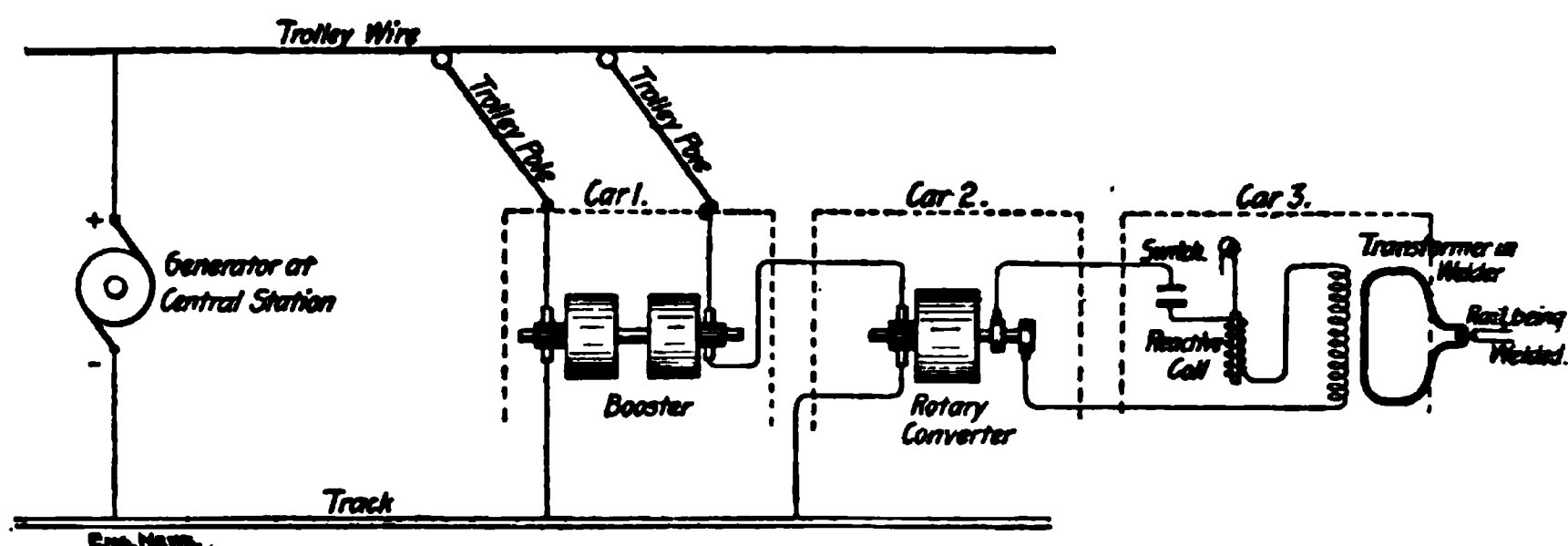
*With load.

The London engines are for tunnel work hauling light rapid transit trains. They have continuous frames and are mounted on two 4-wheel swiveling, driving trucks. The B. & O. engines consist of practically two separate engines coupled back to back each having two axles mounted rigidly in the frames so that the pivoted truck system is eliminated. The Hoboken Shore engine has a continuous frame and is mounted on two 4-wheel trucks. Overhead trolleys are used in all cases.

Europe is awaking to the convenience of electric street railways and within the past two years American manufacturing companies have installed trolley roads in many of the cities of the old world. The trend of electric railway progress seems to be towards longer lines and the use of poly-phase transmission with sub-stations distributed along the line to transform the alternating current to direct current which is supplied to the third rail, underground conductors or trolley, as the case may be. For city service several magnetic or surface contact railways have been tried both here and abroad. So far these have proved unsuccessful. Although it is quite possible, that within a few years a practical and satisfactory surface contact system will be developed. See CONDUIT ELECTRIC RAILWAYS; RAPID TRANSIT; ELECTRIC LIGHT AND POWER STATIONS; and ELECTRIC WELDING.

ELECTRIC VEHICLES. See AUTOMOBILE.

ELECTRIC WELDING OF STREET RAILWAY RAILS. This was first attempted in a practical way in 1893 at Boston, Mass., Cleveland, Ohio, Johnston, Pa., Brooklyn, N. Y., St. Louis, Mo., and Detroit, Mich. The work did not prove entirely successful owing to the injury to the molecular structure the steel rails caused by the intense but necessary heat. A series of experiments was conducted by the company con-



Electric Welding Street Railway Rails. Diagram showing Apparatus and Connections.

trolling the patents, which resulted, it is maintained, in the discovery of a method whereby this difficulty is eliminated. In the past year 45,000 ft. of track were welded for the Nassau Electric Railroad of Brooklyn, N. Y., with satisfactory results. The process is as follows:

The welding equipment, consisting of 4 cars provided with motors, trolley, etc., is run out on the track to be welded. The sand blast car, containing a compressor, sand blast, etc., precedes and cleans the rail joints which have been exposed by excavating the earth for a space about them, and from which the splice or argyle plates have been removed. The "welder" is simply a large transformer with jaws which can be clamped upon the rail. This comes next and a bar of steel 19x3x1 inches is clamped in this way on each side of the rail, using a pressure of 1,400 lbs. Current is then turned on, and allowed to flow for about two minutes during which time the 30,000 or 50,000 amperes heat the splice bars and rail web sufficiently to cause the metals to flow and the bars and rail firmly to unite. Current is then turned off and the clamping pressure increased to 35 tons under which the weld is allowed to cool. Three welds per joint are required, each involving the same process.

The two other cars mentioned contain a machine known as a "booster" which is necessary to steady the varying voltage of the current taken from the trolley wire, and a rotary converter which transforms the 500 volt direct to 300 volt alternating which is transformed by the welder transformer to from 2 to 4 volts and 30,000 to 50,000 amperes; this current strength being required to heat the rail and bars to the fluid state.

ELECTROLYSIS OF GAS AND WATER MAINS. This is the corrosion of underground pipes due to the action of electric currents which escape from electric trolley railways and electric lighting or power circuit that uses a ground return. These leakage currents seek the shortest and best route to return to the power house from which they start. This path is usually along the water and gas mains in the vicinity

of the track. When the current enters these pipes, no destructive action is apparent, but at all points where it leaves the pipe, electrolysis occurs. The extent of this action is dependent upon the amount of the leakage current and the character of the soil surrounding the pipe. A soil containing any corrosive material, such as salt, will greatly accelerate the action. The great danger resulting from electrolysis of this character is the weakening of underground structures to such an extent that accident may result. In the case of water mains, they may burst when most needed, when a fire is raging, for instance, and thus add to the disaster. Although observed in the early days of electric street railway work, the full importance of preventing this destructive action was not realized.

During the year several careful tests were made notably at Dayton, Ohio, and Jersey City, New Jersey, and as a result of these and previous tests, it is quite certain that insurance companies throughout the country will increase the rate of premium in towns and cities when the overhead trolley is in use.

ELECTROMAGNETIC THEORY OF LIGHT. See PHYSICS (paragraph Electromagnetic Waves).

ELECTRO-THERAPEUTIC ASSOCIATION, AMERICAN, organized in 1891, for the cultivation and promotion of knowledge of whatever relates to the use of electricity in medicine. The next annual meeting will be held at Washington, D. C., September 19-21, 1899. President, Francis B. Bishop, M. D.; secretary, John Gein, M. D., of Auburn, N. Y.

ELEMENTS. Seven new chemical elements have been discovered during the year 1898: neon, krypton, metargon, xenon, polonium, coronium and etherion. Each is considered under its name in this work.

ELEUSIS. See ARCHÆOLOGY (paragraph Greece).

ELEVENTH ARMY CORPS ASSOCIATION, organized in 1890, at Portland, Me., had at the close of 1898 a membership of 100. President and historian, Col. Aug. C. Hamlin, vice-presidents, Gen. John T. Lochman, Col. Thomas Reilly, Capt. A. B. Searles, and Gen. L. P. Di Cesnola; treasurer, Capt. F. Wernock; and secretary, Capt. Francis Irsch, 1 Old Slip, New York.

ELIOT, SAMUEL, LL. D., ex-president of Trinity College, Hartford, Connecticut, died in Beverly, Massachusetts, September 15, 1898. He was born in Boston, December 22, 1821; having been graduated at Harvard in 1839, he traveled in Europe for four years; became in 1856 professor of history and political science at Trinity and was president 1860-66. In 1874 he accepted the chair of political science and constitutional law in the same institution. He had previously been a lecturer at Harvard, and headmaster of the Boston Girls' High School; he was superintendent of the Boston schools 1878-80. Dr. Eliot published in 1847 *Passages from the History of Liberty*, which two years later he enlarged under the title *The Liberty of Rome*, and finally republished with additional volumes, as *The History of Liberty*, in 1853. He also published in 1856 a *Manual of United States History*.

ELIZABETH, EMPRESS OF AUSTRIA. ELIZABETH AMELIE EUGENIE, wife of Franz Josef, Emperor of Austria-Hungary, was assassinated by an Italian anarchist calling himself Luccheni, on September 10, 1898, as she was walking from her hotel in Geneva to the lake, where she was expecting to embark. The assassination was made possible by the fact that the Empress, according to her custom, was traveling without attendants, being accompanied only by her lady in waiting. Luccheni, who had come to Geneva to murder some other person of royal blood, but, failing in this, had for a day or two been waiting for the Empress, rushed from behind a tree as she passed and stabbed her in the breast with a stiletto which he had made out of a file. The Empress fell, but recovering herself succeeded in reaching the boat, which immediately put out from the shore. The boat returned, however, for the Empress presently lost consciousness, and she was taken to the hotel, where it was found the steel had touched her heart. She lived but a few minutes.

Luccheni, who was immediately apprehended, gave no reason for his act except that he was a starving anarchist who loved the poor and hated the rich. He was reported to have said in a letter to a Milan newspaper that he had committed the deed "in order that such crimes, following one upon the other, might cause all who impoverish the populace to tremble and shiver." He expressed no regret for having killed an old and inoffensive woman; he said, "Above all, it is the great who must be struck. Not only sovereigns and their ministers will be reached by the comrades, but all who make men miserable on earth. . . . I am an anarchist by conviction." He was twenty-five years old, had been a soldier in the Italian army, and at the time of the assassination was a member of a band of anarchists who a short time before had met in Zurich to plan the death of several European rulers, chief among whom were King Humbert, of Italy, and President Faure, of France. The crime, so brutal, so meaningless and cowardly, appeared even worse from the fact of its being com-

mitted in Switzerland, the country that has generously allowed itself to be an asylum for so many refugees and which has abolished capital punishment.

The immediate result of the murder was a spontaneous outbreak not only of the people and the press, but of the governments of Europe, against anarchism. Emperor William of Germany, along with many others, were in favor of an international effort to seize all anarchists and banish or otherwise dispose of them. Such an attempt to deal with anarchism would doubtless be very poor statesmanship, but the European authorities were driven almost into a state of frenzy by this murder, so atrocious in itself, and following so closely upon the assassinations of President Carnot, of France, and Señor Canovas, the Spanish Prime Minister. Luccheni was convicted at Geneva and on November 10 sentenced to imprisonment for life.

The death of the Empress was a great blow to the old Franz Josef, and seemed to be the culmination of a series of misfortunes to the House of Hapsburg. Among these are the death of Franz Josef's brother, "Emperor Maximilian," who was shot by the order of President Juarez of Mexico, in 1867; the death of the Emperor's only son, Rudolf, which was either murder, suicide, or the result of a duel, at Meyerling, in 1889, after he had shot the Baroness Marie Vetsera; and the "disappearance of the Emperor's only brother, Archduke Johann, who sailed as Captain John Orth from Buenos Ayres, in 1890, and has never been heard of since."

Empress Elizabeth was born December 24, 1837, and was the second daughter of Duke Maximilian Joseph, who was the head of the Birkenfeld-Zweibrücken branch of the Wittelsbach family. After the French revolution this branch, which had previously maintained an independent sovereignty over a small German state, lost its power and the state was incorporated with the Kingdom of Bavaria. The deposed family, however, was permitted to retain its royal rank, its members being entitled "Dukes and Duchesses in Bavaria." The fact that Duke Maximilian had few of the cares of state allowed him to give more time to his children, who were thoroughly and practically educated. "The Empress's eldest brother is Duke Karl Theodor, who, after studying as a physician and an oculist, has established a private hospital on the Tegernsee, and has the reputation of being one of the best oculists living. . . . One sister was the plucky ex-Queen of Naples, who tried to make a man of the imbecile Francis II; another was the Duchesse d'Alençon, who perished in the Bazar de Charité fire in the Rue Jean Goujon at Paris last year (1897), and who, when a girl, refused to become Queen of Bavaria by marrying Ludwig II."

The Empress, who was a most beautiful woman, was married in April 1854, to Franz Josef. Four children were born to them, of whom "two daughters are now living, the Archduchess Gisela, married to Prince Leopold, second son of the Prince-Regent of Bavaria, and the Archduchess Valerie, married to Archduke Franz Salvador of the Tuscany branch of the Hapsburgs." The love of outdoor life which the Empress acquired in childhood never left her and she had a strong dislike for conventionality and court functions. She was a daring horsewoman and fond of sports; much of her time was passed away from Vienna, either on her country estates, in traveling or in extended visits to other countries, particularly England and Ireland. She never publicly manifested any interest in politics, and therefore never incurred the dislike of statesmen, but her aversion to social life made her unpopular at court; in fact, she was never liked in Vienna, though she was always respected, for no word of scandal was ever spoken against her. She was fond of traveling incognito and practically unattended, and it was on account of this fact that her assassination was made possible. Of her intellectual attainments it has been said:

"The Empress Elizabeth was an educated woman and a generous patron of literature and art. Her favorite poet was Heine; she had a monument to him erected on the grounds of her Achilleion when one German town after another was refusing to do him that honor. Besides speaking well the languages of civilized Europe, she was said to be able to speak all the tongues found in the babel of the Austro-Hungarian monarchy, and when well past middle life, thinking to live on a Greek island, she took up the study of Greek and learned to speak it."

Upon the death of the Empress, letters of condolence and sympathy came to Franz Josef from the rulers and officials of all the leading nations of the world. The assassination caused the plans for the celebration of the fiftieth anniversary of Franz Josef's accession to the throne to be postponed. See AUSTRIA-HUNGARY (paragraphs on History).

ELKS, BENEVOLENT AND PROTECTIVE ORDER OF, a fraternal society founded in 1868, has 1 grand lodge, 450 sub-lodges, and 50,000 members in the United States. Since 1868 it has disbursed \$700,000 and \$46,774 in its last fiscal year. John Galvin, Cincinnati, is the Grand Exalted Ruler; G. A. Reynolds, Saginaw, Mich., secretary; and E. S. Orris, Meadville, Pa., treasurer.

EMBRYOLOGY. See DEVELOPMENT OF THE EMBRYO.

EMIGRATION. See IMMIGRATION.

EMPLOYERS' LIABILITY. See DENMARK, FRANCE, ITALY (paragraph Labor Interests; also MISSISSIPPI (paragraph Elections and Legislation).

EMPRESS OF AUSTRIA. See ELIZABETH, EMPRESS OF AUSTRIA.

ENGINEERING. See BRIDGES, CANALS, ELECTRIC RAILWAYS, TALL BUILDINGS, and other articles on engineering topics.

ENGLAND. See ARCHÆOLOGY; GREAT BRITAIN.

ENGLAND, CHURCH OF, "established" as the national church with the Sovereign as its supreme governor, now has two archbishops, 33 diocesan bishops (24 of whom have seats in the House of Lords), and 17 bishops suffragan; there are about 14,000 parishes, about 23,000 clergymen, 90 archdeacons, and 810 rural deans. Each diocesan bishop has a court with legal officials. The Convocations or provincial synods of Canterbury and York are the deliberative bodies of the provinces of Canterbury and York, respectively.

Church Officers.—Archbishop and Primate of All England, Rt. Hon. and Most Rev. Frederick Temple, D. D., Lambeth Palace; Archbishop and Primate of England, Rt. Hon. and Most Rev. William Dalrymple Maclagan, D. D. The bishops are: London, Rt. Hon. and Rt. Rev. Mandell Creighton, D. D.; Westminster, Very Rev. George Granville Bradley, D. D.; Durham, Rt. Rev. Brooks Foss Westcott, D. D.; Winchester, Rt. Rev. Randall T. Davidson, D. D.; Bangor, Rt. Rev. Daniel L. Lloyd, D. D.; Bath and Wells, Rt. Rev. George Wyndham Kennion, D. D.; Bristol, Rt. Rev. George Forrest Brown, D. D.; Carlisle, Rt. Rev. J. Walling Bardsley, D. D.; Chester, Rt. Rev. Francis J. Jayne, D. D.; Chichester, Rt. Rev. Ernest B. Wilberforce, D. D.; Ely, Rt. Rev. Lord Alwyne Compton, D. D.; Exeter, Rt. Rev. Edward H. Bickersteth, D. D.; Gloucester, Rt. Rev. Charles J. Elliott, D. D.; Hereford, Rt. Rev. John Percival, D. D.; Lichfield, Rt. Rev. and Hon. Augustus Legge, D. D.; Lincoln, Rt. Rev. Edward King, D. D.; Liverpool, Rt. Rev. John Charles Ryle, D. D.; Llandaff, Rt. Rev. Richard Lewis, D. D.; Manchester, Rt. Rev. James Moorhouse, D. D.; Newcastle, Rt. Rev. Edgar Jacob, D. D.; Norwich, Rt. Rev. John Sheepshanks, D. D.; Oxford, Rt. Rev. William Stubbs, D. D.; Windsor, Rt. Rev. Philip F. Eliot, D. D.; Peterborough, Rt. Rev. Hon. Edward C. Glyn, D. D.; Ripon, Rt. Rev. William B. Carpenter, D. D.; Rochester, Rt. Rev. Edward S. Talbot, D. D.; St. Albans, Rt. Rev. John Wogan Festing, D. D.; St. Asaph, Rt. Rev. Alfred G. Edwards, D. D.; St. Davids, Rt. Rev. John Owen, D. D.; Salisbury, Rt. Rev. John Wordsworth, D. D.; Sodor and Man, Rt. Rev. Norman D. J. Straton, D. D.; Southwell, Rt. Rev. George Ridding, D. D.; Truro, Rt. Rev. John Gott, D. D.; Wakefield, Rt. Rev. George Rodney Eden, D. D.; and Worcester, Rt. Rev. John James Stewart Perowne, D. D. There are 90 colonial and missionary bishops.

Ritualistic Controversy.—A good deal of excitement was caused in 1898 by the opposition within the Church of England to the practices of the so-called Ritualists and sharp discussion arose early in the year from the action of a certain Mr. Kensit, who addressed a letter to the Bishop of London, complaining of the way in which the services were conducted in his parish church, and especially of the fact that at the high celebration only the priest communicated. In reply the bishop advised Mr. Kensit to attend some church at which the services pleased him better, but at the same time implied that there was no reason why he should be excluded from the communion. It was Mr. Kensit's purpose, however, to protest against the extent to which ritualistic practices had been introduced in the churches, and with this end in view he visited a number of churches attended by followers. These visits, in several instances, resulted in disturbances, and on one occasion, when he and his followers protested against certain services as idolatrous, the affair led to Mr. Kensit's conviction by a magistrate, but the sentence was quashed on appeal. In May a petition, sent by Mr. Kensit to the Bishop of London on the subject of church ritual, led to a discussion of the whole matter in the House of Lords. Later in the month a conference of the clergy, including many of the high church party, passed resolutions declaring the authority of the bishop to enforce the use of services contained in the Book of Common Prayer, and to prohibit any that were not therein. Another influential assemblage of clergymen passed resolutions to the same effect and pledged its members to the use of the services contained in the Book of Common Prayer. There followed several addresses on the part of the bishops to their dioceses on the subject of church ritual. Some of these drew attention to innovations in ritual and doctrine, and demanded that certain practices should be given up. Others urged a spirit of forbearance on both sides with a view to putting an end to what was regarded as an unseemly contest. The Bishop of London declared the services prescribed in the Book of Common Prayer ought not to be altered or replaced by others, that the communion service should be practised exactly as it was set down in that book and that any additional services should first receive the sanction of the bishop. When the Benefices Bill came up in Parliament the ritualistic question was discussed in both houses. Sir William Vernon Harcourt caused much excitement by his at-

tacks on the high church party. He said that the bishops had no authority to permit the use of additional services containing anything that did not form a part of the Bible or of the Book of Common Prayer, with the exception of anthems or hymns. (See GREAT BRITAIN, paragraphs on History.) In a series of letters to the *Times* he defined this position at length. Another blow was struck at the high church party when the Church Association published a strongly worded manifesto against ritualism. The "Gideonites," as the followers of Mr. Kensit were called, occasioned some further disturbances. Many columns of the press were filled with discussion of the matter, especially on the subject of confession. As to the duty of the church toward practices which were said to be uncanonical, the Archbishop of Canterbury, who began his visitation on October 10, made some interesting statements. The Church of England, said he, had given no answer to the question of the real presence and had not forbidden any one to hold or preach the doctrine. It had forbidden the worship of saints and the partial worship of relics, pictures, etc. Prayers for the dead were nowhere forbidden. As to confession, he said that compulsory confession was not admitted. He said that no change in the ceremonial prescribed by the Book of Common Prayer was allowable, except with the approval of the lawful authority, but that additional services, agreeing in substance with the Bible and the Prayer Book were admissible, even though their precise words were not found in either book. The observance of the rubric and obedience to the bishops were enjoined. On October 29 Lord Salisbury declared his sympathy with the opposition to ritualistic practices, saying that no one ought to remain in the church who would not stand by the Book of Common Prayer.

Disestablishment is a policy favored by a considerable body of persons in Great Britain, who advocate the placing of the state churches on the same footing as the other religious organizations. The Church of England is established in England and Wales, and the Presbyterian Church in Scotland. Disestablishment and disendowment have been features of the Liberal programme for many years, and in 1894 a bill for disestablishing the Church of England in Wales was brought in under the Rosebery government, but defeated in the following year by a majority of 44. Disestablishment does not mean that the life interests of the clergy are to be disregarded or that the buildings and endowments, which the churches have derived from the generosity of their worshippers are to be taken away. It was provided in the bill for the disestablishment of the Church of England in Wales that the bishops and clergy should retain during their lifetime their incomes, palaces and parsonages and that the church should retain its buildings and all the wealth it had derived from private beneficiaries for the preceding 233 years, that is since 1662. It was opposed in England as well as in Wales by the friends of the established church. In 1895 a bill for the disestablishment of the Church of Scotland was brought in, but not discussed. The disestablishment movement has been actively furthered in recent years by the so called "Liberation Society," founded for the purpose of freeing religion from state patronage and control. This society did much to bring about the disestablishment of the Irish Church, the opening of the national universities to non-conformists and other measures looking to religious equality. In 1898 it started an active campaign for the purpose of introducing the disestablishment issue into the next general election. The ritualistic controversy, which has just been described, gave it an opportunity to say on October 24, 1898, that it regarded "with concern and apprehension the lawlessness, antagonism and confusion now existing in the established church as the result of the growth of sacerdotalism among its clergy, as well as of other causes," and that it believed the interests of religion to be seriously imperilled. It, therefore, urged, as the only remedy for those evils, the policy of disestablishment.

ENO, AMOS R., a New York real estate speculator, died February 21, 1898. He was born in Simsbury, Connecticut, November 1, 1810; entered the wholesale dry goods business in New York in 1833, from active participation in which he retired in 1857 and gave his attention to ventures in real estate. He was eminently successful and accumulated an immense fortune. Mr. Eno was recognized as a man of integrity and excellent judgment; he was benevolent and always maintained an interest in intellectual pursuits. He will be especially remembered for preventing, at a cost of between \$3,000,000 and \$4,000,000, the failure of the Second National Bank, New York, in 1884, of which his son, John C. Eno, was president. His estate was valued at from \$20,000,000 to \$40,000,000, the greater part of which was left to members of his family. Large amounts were left to many charitable institutions; among other bequests was one of \$150,000, the income of which was to be devoted to indigent members of the Chamber of Commerce, and another of \$50,000 to Amherst College.

ENTERIC FEVER. See TYPHOID FEVER.

ENTERITIS. See PUBLIC HEALTH.

ENTOMOLOGY. See GYPSY MOTH, ZOOLOGICAL SOCIETIES, and ZOOLOGICAL LITERATURE (paragraph Entomology).

ENZYME. See BOTANY (paragraph Plant Physiology).

EOCENE. See **TERTIARY**.

EPHESUS. See **ARCHÆOLOGY** (paragraph Asia Minor).

EPIDEMIC INFLUENZA (LA GRIPPE). The annual visitation of this disease in 1898 has been of unusual severity, and it has invaded territory formerly exempt from its ravages. The contagiousness of influenza is now a settled fact. It is also true that healthy people are more apt to be attacked than those in previously feeble health. Relapses occurred in ten per cent. of the cases. The aërobe causing influenza is called Pfeiffer's bacillus. It was discovered in 1891 by Pfeiffer, Kitasato and Canon, working independently. It is a bacillus occurring singly or in clumps, appearing as a straight rod with rounded ends, non-motile, and not forming spores. It is best stained by a weak solution of carbol-fuchsin applied for at least ten minutes. The bacilli are found chiefly in the respiratory passages, mixed with other organisms in the nasal mucus or in the sputum from the bronchi, and even penetrating the superficial parts of the mucous membrane. It is occasionally found in the blood in small numbers. It is found in the secretion in middle ear inflammation and also in cases of meningitis. The chief symptoms of the disease are due to toxines resident in the bodies of the bacilli and absorbed from the respiratory tract. Experimental inoculation of monkeys has caused high fever followed often by death, no definite results being reached. But there is no evidence that any of the lower animals suffer from influenza in natural conditions. The bacillus has not been found in any other disease but is always present in the secretions of the respiratory tract in true influenza. The symptoms of a typical attack of influenza are headache, with especially severe pain in the orbits and at the base of the occiput; fever, with a temperature of 102° or 103°, generally following an initial chill; great prostration and weakness with mental depression; pain in many of the joints and the bones and tenderness in the muscles; swelling of the mucous lining of the nasal passages with increased flow of mucus; cough, with expectoration of small masses of thick, yellowish and greenish mucus, accompanied by tenderness in the region of the breast bone; rapid and generally weak pulse; buzzing noises in the ears and slight tremor of the whole body. There is an inflammation of the throat, its mucous lining being congested and the palatal folds swollen and rigid. In some cases there is an eruption on the body. In some there is no cough and no bronchial implication. In all there is a danger of pneumonia (see **PNEUMONIA, LOBULAR**), and the patient should be kept in bed, under a physician's care, as long as there is any rise of temperature. Contagion is carried by the sputa and the mucus of the nostrils, and precautionary measures should include sterilization of these discharges with hot water, cleansing the mouth and nostrils, and prevention of the deposition of these secretions upon carpets or furniture. Bed linen should be put into boiling water. The bacilli of influenza die in two days after expulsion from the body.

Authentic epidemics of influenza have occurred frequently since 1173. Its first appearance in this country was in 1789. The pandemic in which the present generation is most interested began in 1889, when the disease overflowed the whole globe. Since that date the country has hardly been free from the disease, for the epidemic of 1893-4 must be viewed as a recrudescence of the former epidemic. Individual cases or small endemics have been separately observed. During December 1898, influenza has been the cause of an unusually large number of deaths. The pandemic of 1889 originated in Central Asia. From Bokhara it was traced successively to Siberia, European Russia, Sweden, Denmark, France, Germany, Belgium and England; Asia Minor, Italy, Turkey and Greece being attacked simultaneously with Germany and England. Shortly thereafter it appeared in Tunis, later in Mexico, South America and Australia. It invaded Boston at the time London was attacked, and San Francisco contemporaneously with Buenos Ayres. It appears to invade trading centres and railroad towns much earlier than sparsely settled districts in the same locality. Human intercourse and especially commerce appear to be the determining factors in its dissemination. See **PUBLIC HEALTH**.

EPILEPTICS, COLONIES FOR. Great advance has been made in the care of epileptics during 1898. The second year of the epileptic colony of New York State, at Sonyea was completed February 1. New Jersey set apart, in September, a tract of 187 acres, the "Maplewood Farm," on the Sourland mountain, near Skillman, for the establishment of an epileptic colony. An adjoining farm of 213 acres is to be acquired also, thus furnishing ample room, when buildings shall have been erected, for over 1,000 patients now confined in jails, or hospitals, or insane asylums throughout the State. The Pennsylvania Epileptic Hospital and Colony Farm, at Oakbourne, was opened May 19. In California detached buildings were erected during the year upon the grounds of the California Home for Feeble-minded, in Sonoma county, for the accommodation of epileptics dependent upon the State. Massachusetts and Ohio have also taken measures to provide separate and special buildings for the care of this unfortunate class. Dr. Frederick Peterson, of New York, president of the Craig

Colony for Epileptics in New York State, from whom we quote many of the succeeding statements, is authority for the claim that there are over 12,000 epileptics in the State of New York alone, some 400 being in insane asylums, and about 600 in county poorhouses. One person being thus afflicted in 500, there are about 130,000 such unfortunates in the United States. The first Colony for Epileptics was the Bethel Epileptic Colony, established by Pastor von Bodelschwingh over 25 years ago, at Bielefeld, near Hanover, Germany. Starting with 4 epileptics, there are now 1,400 in the enlarged and prosperous colony. Several other colonies have been established in Germany, one in Zurich, Switzerland, one in Holland and one in England. A similar institution to Bethel was founded by a clergyman, John Bost, over 40 years ago, in La Force, near Lyons, France. The Craig Colony of New York, the most nearly complete and most extensive in this country, was informally opened for patients February 1, 1896, starting with 1,900 acres of well-cultivated fields, fine orchards and productive market gardens, with about 30 buildings thereon; residences, barns and shops, the latter used in broom-making, canning fruits and vegetables, etc. On the grounds are building-stone quarries, brick clay deposits, and acres of standing timber. A saw-mill and a flouring mill stand ready on a rapid stream, which divides the tract of land into halves. The property formerly constituted the site of a thrifty Shaker settlement. It is the largest in use for this purpose in the world, and is considered ideal in situation and facilities. As such it merits extended reference. The report of Craig Colony for the year ending September 30, 1898, states the census at that date as follows: 165 men, 177 women; total, 342. Sixty-one men and 96 women were admitted during the previous fiscal year, and the discharges and deaths number 61 men and 13 women during the same period. Preference in admission was given to those offering hope of recovery and those who would not be an absolute burden to the colony at the outset of its career. The total deaths during the year were 14, or 3.8 per cent. The per capita, annual cost over the value of articles produced, was \$174.10. During the month of August patients were employed as follows:

Daily average number of men, 150; daily average number employed, 129; daily average number at profitable labor, 99; per cent. employed of total number, 86; daily average value of all male labor, \$46.90.

Daily average number of women, 145; daily average number employed, 122; daily average number at profitable labor, 75; per cent. employed of total number, 83; daily average value of all female labor, \$25.65.

An athletic field has been built, where the patients engage in bicycling, tennis, baseball and track sports. There is a military company of 36 boys and young men, which has regular drills. A band of seventeen pieces has been organized, and has given concerts from time to time.

The average daily attendance in the school has been 25. Instruction is given in reading, writing, letter-writing, language, arithmetic, drawing, kindergarten work, clay modeling and basket weaving. There is also a class in manual training. Ninety per cent. of 275 cases had seizures on an average of one, or more, every seven days. Only 27 had attacks less than a week apart. Seven patients were discharged as recovered during the year. All of these had been kept at the Colony two years after the last seizure, and all will be held under observation hereafter.

EPISCOPAL CHURCH. See PROTESTANT EPISCOPAL CHURCH.

EPWORTH LEAGUE, organized in 1889, by five societies of the M. E. Church, consisting of about 1,500 local societies, or chapters, and 6,000 members. In 1898 the number had increased to 25,554 chapters and 1,800,000 members. The object is to promote piety among the young members of the church. It has prayer meetings, "intellectual" and "mercy and help" departments. The weekly organ is called *The Epworth Herald*. The headquarters are 57 Washington St., Chicago, Ill. Officers for 1899 are: President, Bishop William X. Nide, Detroit; vice-presidents, W. I. Haven, Brookline, Mass., department of mercy and help, Rev. E. M. Mills, Elmira, department of mercy and help, R. R. Doherty, New York, department of literary work, and J. A. Patten, Chattanooga, department of social work; treasurer, C. E. Piper, Chicago; and secretary Edwin A. Schell, Chicago.

EPWORTH LEAGUE OF THE M. E. CHURCH, SOUTH, organized in Memphis in 1891, has the same aims as the foregoing society. Its organ is the *Epworth Era* published in Nashville, Tenn., the headquarters of this league. It numbers 6,533 chapters; and 400,000 members. Officers for 1899: President, Bishop W. A. Chandler, Oxford, Ga.; vice-presidents, J. W. Newman, Birmingham, Ala., W. T. McClure, Independence, Mo., and J. M. Barcus, Temple, Texas; treasurer, O. W. Patton, Nashville; and secretary, H. M. DuBose.

ERITREA, or ERYTHREA, is the name of the possessions of Italy in Africa on the western coast of the Red Sea from Cape Kasar on the north to the French dependency Obok on the Strait of Bab-el-Mandeb, having a coast line of 670 miles, an area of

about 88,500 square miles, and a population estimated at 450,000, of whom in 1893 3,452 Europeans were enumerated. The area, however, has been diminished by the paring down of the Italian territory as the result of negotiations with Abyssinia. It is placed by some at 52,000 square miles. These possessions were constituted as a colony by various decrees from 1890 to 1894. The principal town and seat of government is Massowah on the Red Sea, with a population of 7,775, including about 600 Europeans, not counting the garrison. The Italian government has spent large sums of money on this colony especially on the military account, and thus far it has not paid for itself. The budget for 1897-98 was estimated at 19,800,000 lire, of which 17,900,000 lire were contributed by the home government. Agriculture is still in a primitive stage and its development is checked by the lack of water during the summer season. There is good pasturage, and camels, oxen, goats and sheep are raised. The local trade includes among other articles, meat, hides and butter. The pearl-fishing industry at Massowah and the Dahlak Archipelago is important. Massowah is connected with Saate by a military railway 17 miles in length and by short lines, aggregating about 16 miles, with other points. It is also connected by telegraph line with Assab, which in turn is connected with Perim, making an aggregate of about 380 miles of telegraph. The coins in circulation are mainly Maria Theresa dollars, but the legal currency consists of the Italian coins and those of the Latin Union.

It is administered by a civil governor nominated by the King of Italy and is under the general direction of the Minister of Foreign Affairs, but the Governor being a military officer in active service is in this capacity under the control of the War Office. In 1898 the Governor was Ferdinando Martini, who had set out for the colony at the close of December 1897. Italy gained possession of Massowah, which formerly belonged to Egypt, in 1886. By the treaty of Uchali in 1889 and the supplementary agreement of 1891, Italy secured from King Menelek of Abyssinia Hamesen and the northern districts together with the coast. In 1895 Kassala, which had been captured from the Dervishes by the Italians in the previous year, was occupied in accordance with an agreement with Great Britain that Italy might hold it in trust till the Egyptians were able to regain control. In 1897 the ability of the Egyptian government to do this became evident and in December of that year the Italian commandant evacuated the town. In the meanwhile the Italian army had met with a crushing defeat near Adowa, March 1, 1896, the result of which was the treaty of Adis Abeba on October 6, 1896, restoring to Abyssinia a large part of what had been obtained by Italy and recognizing the complete independence of Menelek's kingdom. The points left unsettled in this treaty were required to be adjusted within a year from its conclusion. In 1897 the Italian government announced its intention of turning Eritrea from a military into a civil and commercial colony, and of reducing the limits of the territory occupied by the military. Till the autumn of 1897 the Italian envoy, Major Nerazzini, was engaged in a fruitless attempt to negotiate a mutually satisfactory boundary line between the Italian territory and that of Abyssinia. At last a line was fixed upon which shut out Italy from two important provinces that she had claimed and gave her a boundary far inferior for purposes of defense. This was accepted by the Italian government, but later when the ministry proposed to limit the military occupation to Massowah, King Menelek was encouraged to reject this boundary and demand further concessions. A commercial treaty, however, was negotiated by the Italian envoy and in this Italy secured the right of sending a representative to the Abyssinian court and full freedom of trade and travel for her citizens in Abyssinia. Both countries bound themselves to promote in all possible ways the facilities for commercial relations between Abyssinia and the Italian possessions. Italy also secured protection for her merchants and the application to herself of the most-favored-nation clause.

ERYSIPELAS. See PUBLIC HEALTH and SERUM THERAPY.

ESSEX INSTITUTE. See ANTHROPOLOGY.

ESTERHAZY, COUNT MARIE CHARLES FERDINAND WALSIN, who was said to have been the real author of the famous *bordereau*, in the Dreyfus case (see FRANCE, paragraphs on History), was a major in the French army. It was not till the autumn of 1897 that his connection with the Dreyfus affair came to light. On Nov. 15, 1897, Mathieu Dreyfus, the brother of the condemned officer, wrote to the Minister of War, Gen. Billot, charging Esterhazy with being the author of the *bordereau*. The court-martial of Esterhazy, which began on Jan. 10, 1898, is discussed in the history of the Dreyfus affair in the article FRANCE. The session was held in secret as soon as it appeared that secrets involving the national defense would be disclosed. The evidence against Esterhazy was procured by Lieutenant-Colonel Picquart, who had observed the identity of Esterhazy's hand-writing with that of the *bordereau*, and had brought the matter to the attention of his chiefs. Esterhazy, upon examination, made a general denial and tried to give the impression that the charges against him were due to plots of the friends of Dreyfus. It was decided that no judicial proof of guilt

had been established, and the verdict of not guilty was received with great enthusiasm by the crowd outside the court room. Major Esterhazy was summoned as a witness in the trial of M. Zola, but turned his back on the counsel for the defense, and during an entire hour remained silent, while M. Clemenceau read a long list of questions bringing out the discreditable acts of his past life. In the spring of 1898, however, strong evidence appeared in proof of Major Esterhazy's guilt. A letter was published by a diplomatist living in Switzerland, revealing the relations between Major Esterhazy and the German military attaché at Paris. It was said that Major Esterhazy was in constant communication with that officer, and that upon the arrest of Dreyfus, the attaché was in great anxiety until he found out that the prisoner was not Esterhazy. The German attaché, it was said, had proof of the unjust conviction of Dreyfus, and had confided his views to the Italian military attaché, to whom he said that Esterhazy had threatened his life if he would not go to the Dreyfus family and say that he had positive proof of the guilt of Dreyfus. On Sept. 9, soon after the death of Colonel Henry, Esterhazy disappeared from France, but soon afterwards it was reported that he was staying in London, where it was said that he admitted to several persons that he wrote the *Dreyfus bordereau*. He is also said to have declared that he had tried in vain to convince General Pellieux that the Henry document was a forgery and that he intended to publish a book which would throw much information on the Dreyfus affair. Extracts from this book were published by a French newspaper in November in which the author reasserts that he was the tool of the General Staff and that he left France to escape being assassinated or being driven to suicide like Lieutenant-Colonel Henry.

ETHERION. Few facts have been established regarding etherion, lately discovered by Charles F. Brush, an American scientist and electrician. It is believed to be far lighter than hydrogen, with a much greater heat conductivity. It probably extends indefinitely into space, and its molecules have a very rapid rate of vibration.

ETHNOLOGY. See ANTHROPOLOGY.

ETRUSCAN CIVILIZATION, CHRONOLOGY. See ARCHÆOLOGY (paragraph Italy).

EUROPE, FLORA OF. See BOTANY (paragraphs Systematic Botany, Europe, Ecology and Plant Geography).

EVANGELICAL ASSOCIATION, sometimes incorrectly called the German Methodist Church, had a successful year. It reports 1,787 churches, 1,053 ministers, and 116,714 members, showing an increase of the latter of nearly 22,000 since 1897. There were 2,269 Sunday schools, with 145,413 scholars, and the Young Peoples' Alliance numbered 34,649 members. Altogether \$934,742 were contributed. The General Conference, which meets quadrennially, will be held in October 1899, at St. Paul, Minn. The German and United Evangelical associations have, according to the last report of the commissioner of education, 3 institutions of higher education with 16 officers of instruction, 159 students, and endowment funds of \$4,475.

EVANS, ROBLEY D., Captain, U. S. N., was born in Virginia in 1846. He served in the Civil War; was finally promoted to a captaincy in the navy, June 27, 1893; on July 19, 1894, he took command of the armored cruiser *New York*, and of the battleship *Indiana* on the 23d of the following August. Subsequently he was given lighthouse duty, but in March 1898, at his own request, he was detached from this and was placed in command of the battleship *Iowa*. He held this command during the Spanish-American War and in the naval fight off Santiago, July 3, 1898. See SPANISH-AMERICAN WAR.

EVOLUTION, THEORY OF. See BIOLOGY (paragraph Heredity), also ZOÖLOGICAL SOCIETIES (paragraph British Association).

EXPECTORATION. See SANITARY LEGISLATION.

EXPERIMENTAL PSYCHOLOGY. See PSYCHOLOGY, EXPERIMENTAL.

EXPERIMENT STATIONS, STATE. See IRRIGATION.

EXPORTS. See IMPORTS AND EXPORTS.

FABIAN SOCIETY. A society with socialistic aims, founded in England in 1883. Local branches have been established in the towns of the United Kingdom and in the United States, but since the formation of the Independent Labor Party (see SOCIALISM, paragraph Great Britain) many of its members have become merged in the latter. The membership of the society in 1898 was placed at 835. It carries on an active propagandism and its members deliver gratuitous lectures in all parts of the country. It preaches the necessity of taking the ownership of land and of industrial capital from the individual and vesting it in the community for the general benefit.

FABRE, FERDINAND, French poet and novelist, was born at Bédarieux, Hérault, France, in 1830, and died February 11, 1898. His first publication, *Feuilles de Lierre*,

appeared in 1853; so much penetrating analysis is displayed in his *Scènes de la Vie Cléricale* that Sainte-Beuve honored Fabre by calling him "a brave disciple of Balzac." It is said that the life and manners of the French clergy perhaps have not been better portrayed by any other writer. Among his other well known works are *Les Courbezou, Julien Savignac, L'Abbé Tigrane, Chevrier, Mon Oncle Célestin, L'Abbé Roitelet, and Un Illuminé.*

FAIRBANK, CALVIN, died at Angelica, New York, October 12, 1898. He was born at Pike, New York, in 1816, and at an early age entered actively into the abolition movement. He rendered assistance to many slaves in escaping to the free States and frequently violated the Fugitive Slave Law after the passage of that act. On account of his zeal against slavery he was arrested in Kentucky, and in September 1844, was sentenced to fifteen years' imprisonment at Frankfort. He was pardoned, however, in August 1849. In November 1851, he was again arrested, at Jeffersonville, Indiana, was taken to Kentucky, and again sentenced to fifteen years' imprisonment at Frankfort. He was pardoned in June 1864. During these imprisonments he was cruelly maltreated, and his health was impaired by the unsanitary condition of his prison and the more than one thousand floggings that he had received. Mr. Fairbank was a friend of many prominent abolitionists. He was the author of *How the Way was Prepared.*

FAIRBANKS, CHARLES WARREN, Republican Federal Senator from Indiana, was born May 11, 1852, near Unionville Center, Union county, Ohio; in 1872 was graduated in the classical course at Ohio Wesleyan University, Delaware, Ohio; studied law and was admitted to the bar. In 1874 he removed to Indianapolis. Mr. Fairbanks was a delegate at large to the St. Louis Republican national convention (1896), of which he was temporary chairman. He never held any public office until he took his seat in the United States Senate, March 4, 1897, having been elected January 20, preceding, by a majority of 21 on joint ballot, over Daniel W. Voorhees and Leroy Templeton. He was chairman of the American delegation of the Anglo-American Joint High Commission which was created in May 1898. For an account of this commission, see CANADA.

FALKLAND ISLANDS, a crown colony of Great Britain, consisting of about 100 small islands situated 300 miles east of the strait of Magellan. The total area is 6,500 square miles, of which East Falkland contains 3,000 and West Falkland 2,300. The population in 1891 was 1,789—1,086 males, 703 females; of this number 123 were foreigners; the population in 1896 was 1,992. There is a legislative council, an executive council, and a governor, the incumbent in 1898 being William Grey-Wilson (appointed Mar. 1897). The only military force is a small volunteer corps. The principal town and seat of government is Stanley, having a population of 694. In 1896 there were two government schools, one Roman Catholic, one Baptist, and the Darwin school, having a total of 253 pupils. The most important industry is sheep-raising, there being 761,768 sheep and 2,325,154 acres of pasturage. Statistics of finance:

	1894.	1895.	1896.
Revenue	£11,958	£12,518	£12,358
Expenditure	12,395	13,159	13,569
Imports	62,270	71,826	69,985
Exports	131,801	122,988	132,194

In 1896 the chief sources of revenue were: rents of crown lands, £4,916, and customs, £2,804; chief expenditures: official salaries, £5,693, mails, £3,000, and public works, £2,151. The more important exports are: wool, frozen mutton, hides, skins, and tallow; imports: provisions, clothing, machinery and tools, timber and building materials. Of the exports (1896) £131,186 went to Great Britain and £1,008 to other countries; of the imports (1896) £62,641 came from Great Britain and £7,344 from other countries. South Georgia, a barren and uninhabited island 1,000 miles E. S. E., has been annexed to the colony.

FARM ANIMALS. The following table published by the Department of Agriculture shows the number of farm animals in the United States by States and Territories on January 1, 1899.

STATES AND TERRITORIES.	HORSES.	MULES.	MILCH COWS.	OTHER CATTLE.	SHEEP.	SWINE.
Maine.....	111,987	.....	197,878	109,440	246,628	75,306
New Hampshire.....	55,028	.....	136,826	79,880	78,289	55,104
Vermont.....	84,812	.....	271,602	183,788	165,940	76,208
Massachusetts....	63,478	.....	179,791	74,875	40,437	54,846
Rhode Island.....	10,281	.....	25,511	10,356	10,715	18,722

STATES AND TERRITORIES.	HORSES.	MULES.	MILCH COWS.	OTHER CATTLE.	SHEEP.	SWINE.
Connecticut.....	43,988	.....	143,098	66,568	21,748	54,186
New York.....	693,736	4,481	1,488,261	561,077	841,965	645,237
New Jersey.....	79,180	7,299	214,674	41,556	42,309	151,710
Pennsylvania.....	548,747	37,068	694,280	628,943	709,604	1,042,231
Delaware.....	80,666	4,323	35,378	22,996	12,981	80,559
Maryland.....	129,662	12,698	155,022	106,900	136,126	381,853
Virginia.....	228,940	25,996	244,987	388,542	299,527	917,530
North Carolina.....	148,667	111,398	248,368	395,560	261,400	1,369,708
South Carolina.....	68,979	97,337	126,782	141,609	66,540	1,041,462
Georgia.....	110,266	169,594	297,324	423,018	327,584	2,065,385
Florida.....	87,673	8,354	114,251	225,774	83,508	429,130
Alabama.....	123,224	129,726	254,727	336,479	193,038	1,869,480
Mississippi.....	201,477	163,032	256,961	304,118	239,720	1,957,399
Louisiana.....	143,696	90,904	126,747	182,690	119,168	736,498
Texas.....	1,137,015	365,880	700,808	4,533,897	2,543,917	2,884,917
Arkansas.....	234,596	148,504	196,808	270,528	119,738	1,290,130
Tennessee.....	317,801	161,295	254,678	322,298	296,098	1,570,134
West Virginia.....	151,847	7,412	163,396	243,460	440,014	381,568
Kentucky.....	365,802	106,547	248,308	841,181	597,643	1,387,765
Ohio.....	655,499	17,223	736,736	696,438	2,730,471	2,207,051
Michigan.....	410,410	2,646	459,107	841,555	1,309,058	735,035
Indiana.....	901,271	41,850	611,975	841,913	674,322	1,240,231
Illinois.....	1,003,200	32,225	1,001,212	1,295,666	613,191	2,002,325
Wisconsin.....	499,232	4,764	395,222	549,315	722,167	929,732
Minnesota.....	455,132	8,416	645,673	570,185	410,966	411,333
Iowa.....	961,852	31,547	1,250,775	2,163,564	613,348	3,408,291
Missouri.....	762,734	183,363	673,196	1,460,647	616,102	2,949,818
Kansas.....	734,381	79,410	680,457	2,076,489	231,162	1,591,341
Nebraska.....	653,284	43,016	686,750	1,396,229	202,779	1,352,657
South Dakota.....	290,746	6,696	372,221	449,362	363,067	145,461
North Dakota.....	175,137	7,066	171,078	232,640	359,721	111,959
Montana.....	164,223	324	43,994	952,598	3,577,547	42,265
Wyoming.....	72,258	1,514	18,140	694,973	2,329,025	22,245
Colorado.....	148,667	8,067	91,698	973,259	1,655,331	20,718
New Mexico.....	83,351	8,472	19,217	701,967	8,129,692	30,534
Arizona.....	50,414	1,041	18,404	861,812	1,014,227	22,298
Utah.....	68,296	1,599	67,787	808,118	2,116,949	47,608
Nevada.....	44,306	1,394	16,089	224,817	576,964	10,441
Idaho.....	128,077	917	31,300	364,056	2,311,890	78,716
Washington.....	169,694	1,441	115,485	266,376	769,834	158,741
Oregon.....	185,844	5,909	116,581	573,646	2,573,468	210,430
California.....	842,265	32,915	518,435	664,704	2,175,545	374,141
Oklahoma.....	42,849	8,407	37,014	297,505	22,022	69,891
Total.....	12,665,307	2,184,218	15,990,115	27,994,226	10,114,448	28,651,691

FAUCIT, HELEN (Lady Theodore Martin), a celebrated English actress, died at her home, Bryntyrilio, near Llangollen, Wales, October 31, 1898. She was born in England in 1820 and was the daughter of an actress of considerable ability. She made her debut at Covent Garden, London, January 5, 1836, as "Julia" in *The Hunchback*. She was eminently successful and soon was recognized as an actress of the highest rank. Miss Faucit was the first to interpret the character of the heroines in a number of well known dramas, including *Richeieu* and *The Lady of Lyons*. Her fame rests not only on these successes but on her superb rendering of Shakespearean rôles, among which were "Constance," "Juliet," "Imogen," "Beatrice," "Hermione," "Portia," "Cordelia," "Desdemona," "Rosalind," and "Lady Macbeth." She achieved a great success in *King Ren's Daughter*, an adaptation from the Danish of Henrik Herz by Mr. Theodore Martin. This writer, who is well known as a metrical translator of modern and classical poets, she married in 1851. After this time her public appearances were infrequent, the last ones being as "Beatrice" at Stratford-on-Avon at the opening of the Memorial Theatre, April 1879, and as "Rosalind" at Manchester in October of the same year. The latter appearance was for the benefit of the widow of Charles Calvert. She published a successful work, *On Some of the Female Characters of Shakespeare*. Her husband was knighted in 1880.

FAULKNER, CHARLES JAMES, Democratic United States Senator from West Virginia, on September 19, 1898, succeeded Senator George Gray, of Delaware, as a member of the Anglo-American Joint High Commission, which was created in May 1898. Senator Gray resigned the position to become a member of the commission appointed to negotiate the treaty of peace with Spain. Senator Faulkner was born in Martinsburg, West Virginia, September 21, 1847. His father, C. F. Faulkner, represented both Virginia and West Virginia in Congress and was appointed by President Buchanan minister to France. Young Faulkner accompanied him in 1859, and attended noted schools in Paris and Switzerland. Upon the outbreak of the Civil War he returned, and entered the Virginia Military Institute at Lexington. On

May 15, 1864, he served with the cadets in the battle of Newmarket; soon after he became aid to the Confederate General J. C. Breckenridge, and subsequently to Gen. Henry A. Wise, with whom he surrendered at Appomattox. Faulkner was tutored by his father until October 1866, when he entered the University of Virginia, being graduated in June 1868, and in September of that year he was admitted to the bar. In October 1880, he was elected judge of the thirteenth judicial circuit (Jefferson, Morgan and Berkeley counties); succeeded Johnson N. Camden in the Federal Senate, March 4, 1887, and was re-elected in 1893. He is a member of several important Senate committees, including appropriations, immigration, and the judiciary. In 1888 he was permanent chairman of the Democratic State convention of West Virginia, and in 1892 both temporary and permanent chairman. In 1894 and 1896 he was chairman of the Democratic Congressional campaign committee. For an account of the Joint High Commission above mentioned, see CANADA.

FAURE, FRANCOIS FELIX, sixth president of the third French Republic, was born in Paris, January 30, 1841. His father, who was a cabinet maker, succeeded in educating him for a business career. When ten years old young Faure entered the Institution Bousquet at Chaillot and afterward passed two years in England. Returning to France he served for three years as a tanner's apprentice at Amboise and then was engaged by a large leather firm at Havre, where he soon established a business for himself which became well known. At the breaking out of the Franco-Prussian War (1870) he was a ship-owner and president of the Chamber of Commerce at Havre. He served in the war as a captain in the Garde Mobile, and for bravery was rewarded with the cross of the Legion of Honor. He entered public life in 1881 as a member of the Chamber of Deputies from Havre; was Under-Secretary of State for Commerce in Gambetta's cabinet (1881), held the same position in Ferry's cabinet (1883), and in 1888 was Under-Secretary for the Colonies in the cabinet of M. Tizard. In 1894 he became Minister of Marine and on January 17 of the following year was elected President, as a moderate Republican, by 430 votes against 361 for M. Henri Brisson, to succeed M. Jean Paul Casimir-Périer, resigned. He has been recognized as an astute politician, but not a great statesman. In 1895 underhand attacks were made on his social standing, and in December of that year he issued a statement in which he said that in 1841 his father-in-law had been found guilty of malversation and that he had married the daughter with full knowledge of the facts of the case. He also stated that at the time of his election to the presidency he had apprised the foreign ambassadors of these facts and that no power had protested. This action met with general approval. In 1879 he was chosen to arbitrate the boundary dispute between Colombia and Costa Rica.

FEBIGER, JOHN CARSON, Rear-Admiral, U. S. N., retired, died at Londonderry, Maryland, October 9, 1898. He was the grandson of Christian Febiger, the Revolutionary officer, and was born at Pittsburg, Pennsylvania, September 14, 1821; entered the navy from Ohio as a midshipman in September 1838, and served in South American and African waters. He was promoted passed midshipman in 1844, lieutenant in 1853, and received his commission as commander in August 1862, being assigned to the steamer *Kanawha*, of the West Gulf blockading squadron. After having various commands he was assigned to the North Atlantic squadron in 1864, and on May 5 of that year took part in defeating the Confederate ram *Albemarle* in Albemarle Sound, North Carolina. For gallantry and skill in the engagement he was commended by Rear-Admiral Samuel P. Lee. He became captain in 1868 and commodore in 1874. He was inspector of naval reserve lands, 1869-72, was a member of the board of examiners, 1874-76, and for the next four years was in command of the navy-yard at Washington. In February 1882 he was made a rear-admiral and on July 1, of that year was retired at his own request.

FEDERATION OF LABOR, AMERICAN, organized in 1886, is composed of 67 national unions, 10 state branches, 79 city central unions, and 359 local unions, with a total membership of 625,000. About 270 weekly and monthly papers are published, but the *American Federationist* is the official organ. It aims to regulate all industrial employment, the wages of laborers, and the formation of public opinion, through the press, platform, and legislation. President, Samuel Gompers, New York; secretary, Frank Morrison, Washington, D. C.

PEEBLE-MINDED, EDUCATION OF THE. See EDUCATION.

FELDSPAR. The production for 1897 (figures for this year being the latest obtainable) amounted to approximately 21,000 tons valued at \$113,773. Nearly the entire output is consumed by pottery manufacturers for use either as a flux in pottery or for glazes. The important producing States were Maine, Connecticut, Pennsylvania, and New York. Feldspar deposits of commercial value have recently been described as occurring in the serpentine rocks of southeastern Pennsylvania, especially in Chester Co. Some of the veins are 25 to 30 feet thick and have been explored to a depth of 60 feet.

FERGHANA. See **RUSSIA** (paragraphs on History).

FERMENTATION. It has been fairly conclusively shown that alcoholic fermentation can take place without the presence of yeast cells. The yeast contains a chemical body (first brought out by Buchner) that is capable of causing fermentation.

FERMENTS. F. C. Newcomb has isolated a new ferment or enzyme, which is capable of digesting cellulose. He has obtained it from the seeds of the date and from a lupine, *lupinus albus*, and also from a mould, *aspergillus oryzae*. It is not the same as diastase, the widely distributed form of vegetable ferment, although it has some of the same properties on starch and other substances. The aspergillus ferment acts most energetically on cellulose, that obtained from the seed of the date the least.

FERNS. See **BOTANY**.

FIELD COLUMBIAN MUSEUM. See **ANTHROPOLOGY**.

FIJI ISLANDS are a group in the Southern Pacific belonging to Great Britain, and having an area of 8,045 square miles and an estimated population on December 31, 1896, of 120,500, of whom 3,292 were Europeans, 1,201 half castes, and the remainder divided among Indians, Polynesians, Rotumans, Fijians, and others. The largest island in the group is Viti Levu with an area of 4,250 square miles, and the next in size is Vanua Levu, with about 2,600 square miles. The surface is hilly and the soil fertile, owing to the abundant rainfall. The islands are well wooded and have luxuriant vegetation. Among the chief products and exports are sugar, copra, fruit, distilled spirits, and cotton. There are many plantations on the islands and tobacco, sugar, cotton, and a variety of tropical fruits are raised on them. The greater part of the trade is with the colonies of Great Britain, especially with New Zealand, New South Wales, Victoria, and New Caledonia. With Great Britain the direct trade is very small. Between 1891 and 1896 the total foreign trade fluctuated considerably, being £727,383 in 1891, rising to £867,633 in 1894, and falling to £677,834 in 1896. Most of the natives have abandoned their idols and become professed Christians. The Wesleyans were the earliest missionaries to attempt the conversion of the islands and in 1896 the number of persons in regular attendance at the churches of the Wesleyan mission was 96,421. The work of the Roman Catholic mission has also been important and in 1896 the number attending Roman Catholic missions was 9,437. The political status of Fiji is that of a crown colony in which a Governor assisted by an executive council is at the head of the administration. There is a legislative council under the presidency of the Governor, having six official members, and six unofficial members, nominated by the Crown. In 1898 the Governor and Commander-in-Chief and High Commissioner for the Western Pacific was Sir G. T. M. O'Brien.

FILTERS. See **SEWAGE PURIFICATION AND WATER PURIFICATION**.

FINANCE. The treatment of financial topics in this volume will be found under the head of the principal countries. See also the separate articles **CURRENCY REFORM**, **TARIFF**, **BANKS—BANKING**, **MONEY**, etc.

FINLAND is a Grand Duchy of Russia with an area of 144,255 square miles and a population in 1897 of 2,483,249. Its agricultural importance has declined since its incorporation with Russia but it has greatly advanced in respect to fisheries, cattle-breeding, and manufacturing industries. Its chief crops are oats, rye, barley, potatoes, peas, wheat, and flax; and there are various manufactories including iron and mechanical works, dress and dyeing establishments, wood and bone industries, and factories for the production of leather, paper, chemicals, and textiles. The exports from Finland in 1896 were 158,900,000 marks, and the imports 172,600,000 marks. The chief countries to which Finland exported in 1896 were, in the order of their importance, Russia, Great Britain, Denmark, France, Germany, Sweden and Norway, and Spain. The most valuable of the exports were the products of the forest, timber, butter, paper, cardboard, iron, and iron goods. The State has built and at present owns almost all the railways. The railway mileage in January 1897, was 1,505, all but 20 being the property of the State. The standard is gold, and the unit of value is the *markka*, which is equivalent to about 20 cents in United States money (19.3 cents in 1898). The predominant religion is Lutheran, and at the end of 1896 the members of this church numbered 2,473,441. Next in importance is the Greek Orthodox Church, whose members, together with the Raskolniks, numbered 46,509. There is one university at the present capital, Helsingfors, a flourishing institution with 2,010 students (1896). As to the education of children, a United States Consul reported in 1898 that there were 1,400 schools supported in part by the government, and of these 21 were intermediate schools. Attendance at school begins at the age of ten, children between the ages of seven and ten receiving instruction at home by the parish priest. Co-education has been introduced in the schools and in the university with success. Adequate instruction is given to men and women teachers, and the latter are said to be especially capable. Never-

theless it was stated in this same Consular Report that only about 38 per cent. of the population in Finland can read and write. Finland has a national parliament of its own consisting of representatives of the four estates, namely, nobles, clergy, burghers, and peasants. The Emperor of Russia, who is the Grand Duke of Finland, summons this assembly, and in legislation has the right of initiative and veto. The highest administrative authority is exercised by a Senate which sits at Helsingfors, and whose members are nominated by the Emperor and presided over by the Governor-General of Finland. This Senate controls provincial affairs, while military and foreign affairs are for the most part directed by the imperial officials. An important event in the political history of Finland during the year 1898 was the issue of an imperial ukase for the purpose of bringing the Finnish law of military service into harmony with the law in force in the other parts of the empire. Hitherto Finland has enjoyed a certain independence in military affairs, the Finnish regiments not being required to serve beyond the limits of the Grand Duchy. In the fall of 1898 it was reported that a special meeting of the Diet was to be called in the following January to give official sanction to the imperial plan.

FIRE BOATS. See FIRE PROTECTION.

FIRE PROOFING. See TALL BUILDINGS (paragraph Fire Proofing).

FIRE PROTECTION. Supplementary systems of water mains and fire hydrants have been installed during the past few years at Cleveland, Milwaukee, Detroit, Buffalo, Providence and Boston to afford a more ample supply and higher pressure than can be obtained from the regular water works system. The latest instance is at Boston, where the supplementary plant was put in operation in the latter part of 1898. This system uses salt water, while the others named use fresh water. At Boston, a 12-in. cast iron main 5,000 ft. long, extends from the shore to a point near the post-office, affording special protection to the business district. Two fire boats may be connected with the fire mains by means of hose. Hydrants of special design are placed at intervals on the fire main and there is an electric signal system between the boats, hydrants and some of the near-by fire stations. The main is kept filled and under pressure. The valves are of composition metal, to prevent rust, and are insulated from the iron mains by means of rubber to prevent galvanic action. At Providence, a special system of fire mains was put in operation in October 1897. These are supplied from the high service of the regular waterworks, but are devoted to fire protection.

The new fire boat, Robert A. Van Wyck, for the New York Fire Department, went into service in April 1898. Its hull is of steel, 111 ft. long over all, 24 ft. beam; draft, loaded, 9 ft.; displacement, load water line, 307 tons. She is provided with two sets of pumps, which on test delivered about 3,200 gallons per minute each, with pump pressures of about 180 lbs. The boat was designed by Mr. H. de B. Parsons, of New York City.

FISHERIES. No more interesting or satisfactory occurrence in the records of fish and fisheries can be chronicled for the year 1898 than the new vigor which has come into the United States Fish Commission under Commissioner George M. Bowers. It must be admitted that the proposal of his name aroused the bitterest opposition of scientists and practical fish culturists and no little apprehension was felt when his nomination was confirmed. But in justice it must be said that there has not been a year since Professor Baird's death when the scientific side of the Fish Commission's work has received a larger share of attention, or when outside scientists have been more cordially assisted. The appointment by the Commissioner of Professor H. C. Bumpus as director of the Biological Station at Woods Holl, was a guarantee that that station would be loyal to the plans of Professor Baird, and was the first intimation of the liberal policy which has since been pursued. The station has been open to investigators since March and every courtesy and convenience have been shown to visiting biologists. The war with Spain deprived the commission of its best boats but the *Grampus* was in service at Woods Holl during August and September and proved of very great value. (See DISTRIBUTION, second paragraph.) But more than by simply assisting biologists, the Woods Holl station has proved its practical value by its additions to our knowledge of the distribution of fishes along the southern New England coast, and during the year several species have been added to the list of fishes known from that region. The Commission has extended these investigations along the southern shores of Long Island also. A very interesting study has been made of the color, size and proportions of flat-fish from various points in Buzzard's and Narragansett bays, which seems to show that fish from one locality are recognizably different from specimens of the same species taken only a few miles away. The Commission also began a biological survey of Lake Erie, making the station at Put-in-Bay, Ohio, the headquarters of a party of biologists, whose investigations, into the zoölogy and botany of the lake, have already more than warranted their appointment. The work will extend over the entire year and an elaborate plan for the study

of the fauna and flora of the lake has been outlined, and will be followed as closely as circumstances will permit. Experimental work is being carried on along a number of different lines, such problems being investigated as the rate of growth of fishes, the food of young fishes, etc. Observations on the food habits, distribution and migration of the lake fishes are also being recorded. Special attention has already been given to plankton problems. The whole work will have important bearings on the extensive fishing interests of the Lake and it is hoped will throw some light on, and offer some remedy for, the recent serious depletion in the supply of certain valuable food fishes. A similar survey has been planned for Great Salt Lake, Utah, from which very interesting results may be expected. The Commissioner has presented to Cornell University a large collection of fishes for its museum. From the point of view of a biologist, the Commission has never had a more useful year, and it is therefore doubly gratifying that from the practical side the year has been exceptionally prosperous and an unprecedented number of fish have been hatched and distributed. See ZOÖLOGICAL STATIONS (paragraph United States Fish Commission).

The fishing interests of the United States were represented by delegates at the second International Sea Fisheries Congress held at Dieppe, France, early in September. There were more than 300 members present, representing ten countries and more than 40 communications on fishery problems were presented. The Congress met in four sections discussing respectively scientific research, fishery apparatus, technical education and fishery regulations. Many of the papers were of great importance and aroused considerable discussion. One of the most important movements started was for a joint Anglo-Saxon biological and physical survey of the English channel during 1899. Resolutions were adopted recommending the prohibition of trawling within three miles of low water mark, and the sale of immature fish, the minimum size for each species to be fixed by an international committee.

At the meeting of the British Association at Bristol, the committee appointed some years ago on the "Life Conditions of the Oyster: Normal and Abnormal," and of which Professor W. A. Herdman was chairman, presented its third and final report. The result of their investigations will probably have a marked effect on the oyster fisheries of the United States as well as of Europe. Their important conclusions can hardly be more than mentioned here, but the facts from which they draw them seem to be well established. Greenness in oysters is not always due to pathological conditions nor to excess of copper in the animal, but in many cases it certainly is. The Colon group of bacilli (to which the bacillus of typhoid fever belongs) is frequently found in oysters and other shell-fish as sold in the towns, but there is no evidence to show that it occurs in those from pure sea-water. On the other hand, it must not be assumed that the presence of Colon bacilli invariably indicates sewage contamination. No typical bacilli of typhoid were found in any shell-fish examined. Nevertheless the committee recommends that the greatest care to prevent sewage contamination should be taken both by the government and by the oyster dealers themselves, and further that oysters imported from abroad should be carefully inspected and certificated. The recommendation is also made that the grounds from which mussels, cockles and other mollusks are collected should be inspected as carefully as the oyster beds themselves.

One of the most interesting undertakings in the world of fisheries was brought to an unsuccessful termination in the spring of the year, in the attempt of the "Caribbean Sea Fisheries Development Syndicate" to carry on fishing in West Indian waters on a large scale. It has long been a curious fact that while a large part of the food of the inhabitants of Jamaica is fish, a very large proportion of it is imported as salt-fish. In view of the apparently great abundance of fish all around the island this fisheries company anticipated that a properly equipped steam "trawler" would be able to do a flourishing business in the capture and sale of these fish by wholesale. Accordingly the *Capricornus* was chartered in England and sent to Jamaica with an experienced crew and a full supply of the best apparatus. Operations were begun outside of Kingston harbor on January 27 and were continued until well into April. The results were disappointing in the extreme, as the whole amount of fish taken was absurdly small. The most remarkable fact was the apparent absence of fish, but even if they had proved as abundant as was expected, it is probable that a steam-trawler would not pay, for two very curious reasons. Trawling is itself out of the question in most places about the island, owing to the abundance of coral, which tears the nets to pieces or prevents the dragging of the trawl at all. In only a few places was a coral-free bottom of sufficient extent for trawling found, and in such places very few fish were taken. Line fishing on a large scale is equally out of the question, because the sharks and barracudas are so abundant that they eat the fish off the lines before the latter can be properly handled. These two obstacles, so foreign to the trawl-fishermen of the north Atlantic, seem to make the development of fisheries in the tropics on a large scale impossible. Although from a commercial point of view this attempt has proven such an unfortunate failure, yet the results

have been of no little importance to all interested in the biological questions involved as well as to those interested in the development of the industries of the West Indian region. See BEHRING SEA DISPUTE and CANADA.

FISHERIES SOCIETY, AMERICAN, organized in 1871, has 250 members. President, George F. Peabody; secretary, Herschel Whittaker, Detroit, Mich. Its next meeting will occur at Niagara Falls, June 28-30, 1899.

FLAG ASSOCIATION, AMERICAN, founded June 2, 1898, to secure national legislation for the protection of the flag from degrading and desecrating uses and to secure a general celebration of June 14 as "Flag Day," because on that day 1777, Congress selected the flag of the United States. President, Col. Ralph E. Prime; secretary, Gen. Thomas Wilson, 56 E. 76th street, New York.

FLAG HOUSE AND BETSY ROSS MEMORIAL ASSOCIATION, AMERICAN, has its headquarters in the Old Flag House, 239 Arch street, Philadelphia. President, Edmund Brooks; Secretary, John Quincy Adams, 101 W. 89th street, New York.

FLORENCE, the capital of the former duchy of Tuscany in Italy, lies in the valley of the Arno, about 123 feet above the level of the sea. It had, according to the estimates of December 31, 1896, a population of 207,100. An event of interest to Americans in 1898 was the centenary celebration in honor of Amerigo Vespucci, the discoverer, and Paolo Tasconelli, the inventor of the quadrant. An appropriation for this purpose was made by the municipality of Florence, and the time for the festivities was fixed in the month of May. Among the features of the celebration were the unveiling of commemorative statues of Vespucci and Tasconelli by King Humbert, and the display of valuable unpublished documents relating to the services rendered to science by the two famous Florentines.

FLORIDA, the southernmost of the United States, has an area of 56,680 sq. m. Capital, Tallahassee.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 4,244,472 bushels, \$2,122,236; oats, 623,099, \$336,473; potatoes, 116,032, \$139,238; hay, 10,008 tons, \$141,113; and cotton (season of 1897-8), 53,657 bales, \$2,177,021—total value, \$4,916,081. The cotton crop was 29,001 bales of upland and 24,656 of sea-island. Live-stock comprised, horses, 37,673; mules, 8,354; milch cows, 114,251; other cattle, 325,774; sheep, 83,598; and swine, 429,128—total head, 998,778.

Industries.—The last revolution in Cuba prompted an experiment in Florida, which in 1898 had reached the condition of a distinct industry. Secretary Wilson, of the United States Agricultural Department, estimates that fully 40,000 Cubans, thoroughly acquainted with growing, curing, and manufacturing tobacco, had emigrated to Florida. These Cubans soon recognized the fact that the hummock lands of Florida, hitherto principally producing timber, cereals, sugar cane, sea-island cotton, and oranges, according to elevation, are very similar to the best tobacco land in Cuba. Till within a short time the stock of tobacco manufactured in Florida was grown and cured in Cuba. During the calendar year 1897 there were made in Florida 145,652,240 cigars, 4,425,580 cigarettes, and 28,983 pounds of smoking tobacco, and the sales of cigars aggregated 160,000,000. All these were sold in the North as Havana cigars. It is impossible to determine what proportion of this tobacco was grown and cured in Florida, but it is believed that it was considerable. Dr. Stockbridge, of the agricultural experiment station at Lake City, spent much time in 1897-8 experimenting with fertilizers and methods of fermentation to promote tobacco-growing. The sponge industry is steadily increasing in extent and value. Heretofore Key West was the principal market; now St. Marks, Cedar Keys, and Anclote are sharp rivals; and operations are carried on between Tampa Bay and St. Marks, a distance of about 150 miles. This industry now has an annual value of over \$600,000. See FULLER'S EARTH.

Commerce.—During the fiscal year ending June 30, 1898, the imports of merchandise at the ports of Appalachicola, Key West, Pensacola, St. Marks, Tampa, Fernandina, St. Augustine, and St. Johns aggregated in value \$1,136,730, and the exports, \$11,029,516, a decrease in a year of \$652,355 in imports, and \$400,681 in exports.

Transportation.—The total railroad mileage reported at the end of 1896 was 3,125. The legislature in 1897 created a State railroad commission; incorporated the Sanibel Island, the West Florida Gulf Coast, the Alafia, Manatee, and Gulf, and the Tallahassee and Central Florida railroad companies; and extended the time for beginning or completing the Titusville, Canaveral, and Peninsular, the Jacksonville and Tampa Bay, and the South American and International railroads. The new railroad commission is the absolute arbiter of the carrying trade, and can compel all railroads to do its bidding. The law gives the commissioners greater powers than any other State has yet delegated, and places all railroads in the State under an

authority that would be exceedingly dangerous if not exercised conservatively. In September 1897, interest in the agitation for a navigable canal across the peninsula was increased by the incorporation in New York of the Florida Transpeninsular Ship Canal Company, capitalized at \$75,000,000, to construct a ship canal and railroad from St. Augustine to a convenient point on the Gulf of Mexico.

Banks.—On October 31, 1898, there were 15 national banks in operation and 10 in liquidation. The active capital aggregated \$1,300,000; circulation, \$358,552; deposits, \$5,198,496; and reserve, \$2,275,258. The State banks June 30, 1898, numbered 21, and had capital, \$710,000; deposits, \$2,083,065; and resources, \$3,068,054. The exchanges at the United States clearing house, in the year ending September 30, 1898, amounted to \$10,836,179, an increase of \$2,647,664 in a year.

Education.—At the end of the school year 1896-7, there were 165,300 children of school age, of whom 105,415 were enrolled in the public schools, and 69,477 were in daily attendance. The percentage of enrollment by races was: white, 66.18; colored, 65.45. Public school property was valued at over \$600,000, and the expenditures were \$713,443, including \$547,172 for teachers' salaries. There were 28 public high schools; 7 private secondary schools; 2 public and 4 private normal schools; and 6 colleges and universities, co-educational and for men only. The Florida Agricultural College at Lake City, endowed by Congress, received from the Federal government \$22,000 in 1897, and \$23,000 in 1898. In the last year there were 164 periodicals, of which 21 were dailies, 123 weeklies, and 10 monthlies.

Finances.—The assessed valuations in 1897 comprised, real estate and railroad and telegraph property, \$79,369,887; personal property, \$15,747,269—total, \$95,117,156; State tax rate, \$3.50 per \$1,000. The bonded debt January 1, 1898, was \$1,275,000, of which \$922,300 was held by State funds and the balance by individuals. There are also bonds for borrowed money, aggregating \$200,000, of which the school fund holds \$175,000, and the internal improvement fund \$25,000.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 510,000. Local estimates gave Jacksonville, 26,000; Tampa, 25,000; St. Augustine, 4,740; and Palatka, 3,030.

Events of 1898.—An event of importance in Florida during 1898 was the ratification of agreement between the Dawes Commission and the Seminole nation of Indians on July 1. The land allotted at \$5, \$2.50, and \$1.25 per acre (200,000 acres at \$1.25) was bought from the Creek nation. (See FRIENDS OF THE FLORIDA SEMINOLES.) Funds were set apart for churches and schools, and intoxicants are ruled out. The Democratic convention, held on August 8, frankly and boldly condemns imperialism in the following words: "We condemn the policy of insular territorial expansion upon which the Administration at Washington has embarked, as unwise, un-American, unjust to the masses of our people, and especially to the laboring and producing classes, and as dangerous to our free institutions; and we pledge the Democracy of Florida to the opposition to the same; that whereas the present war with Spain was inaugurated for the declared purpose of aiding the Cuban patriots in their struggle for liberty and in the efforts to establish a free government, and we have solemnly announced to the world that we have no intention to annex the island of Cuba to the United States; and whereas war at best is unchristian, demoralizing in its tendencies, and a drain upon all the resources of the country, therefore, when the declared objects of the present war shall be accomplished it will be the duty of the government to grant peace on terms just to this government and honorable to our people, and that in the adjustment of such terms of peace Cuba should be left free by this government and untrammelled by our army and navy to establish, by the free action of her people, a free and independent government of their own; that the Democrats of Florida will support the Administration in all efforts to conduct the present war to an early, honorable, and satisfactory close; and that it would be an act of bad faith on the part of our government and a blot upon our civilization for us, as a result, either directly or indirectly of the war, to annex the Island of Cuba to the United States, and thus to rob the Cubans of that free and independent government for which they have fought so long." See the article UNITED STATES.

Officers.—The delegates to the House of Representatives are Stephen M. Sparkman (Dem.), from Tampa, and Robert W. Davis (Dem.), from Palatka. The Senators are Stephen R. Mallory (Dem.), from Pensacola, and a Democrat. Officials: William D. Bloxam, Governor; J. L. Crawford, Secretary; James B. Whitfield, Treasurer; W. H. Reynolds, Comptroller; W. B. Lamar, Attorney-General; Patrick Houston, Adjutant-General; W. N. Sheats, Superintendent of Public Instruction; and L. B. Wombwell, Commissioner of Agriculture. All are Democrats. Chief Justice, R. F. Taylor; Associates, M. H. Mahry and F. B. Carter, all of whom are Democrats. The State Legislature, consisting of 32 Senators and 68 Representatives, is unanimously Democratic.

FLUORSPAR. The output for the past two years was:

1897—5,062 short tons.....	\$37,159
1898—8,000 short tons.....	48,000

Kentucky supplied the greater amount, the Illinois mines being operated only in the early part of 1898. The American output is used in the production of hydrofluoric acid and opalescent glass, and in smaller quantities as a flux in blast furnaces and Portland cement manufacture.

FOLK-LORE SOCIETY, AMERICAN, founded in 1888 for the study of folk-lore in general and in particular the collection and publication of the folk-lore of North America. It publishes the *Journal of American Folk-lore* (quarterly). President, Henry Woods, Johns Hopkins University, Baltimore; secretary, W. W. Newell, Cambridge, Mass.

FONTANE, THEODOR, German poet, essayist, and novelist, died in Berlin September 21, 1898. He was born at Neuruppin, December 30, 1819. He was a voluminous writer on contemporaneous history, but the first of his writings that gave him prominence dealt with the literature, art, and drama of England. He published a number of novels and stories which were collected and published in 1890-91 in two volumes. Besides his essays and criticisms, his poems became well known, and so successful was he with this latter work that in 1891 his services were recognized by the Emperor by a gift of 3,000 marks. The greater part of his life was passed in Berlin.

FOOTBALL (1898). The result of the games between the so-called "Big Four" universities,—Yale, Harvard, Princeton and the University of Pennsylvania,—showed that Harvard probably had the best team, though she could not claim the championship, in view of the fact that no game was played with Princeton. Harvard defeated Pennsylvania on November 5 by a score of 10 to 0, and Yale, on November 19, by a score of 17 to 0. Princeton won from Yale by 6 to 0 on November 12. In the New England League, Dartmouth won the championship, having defeated Amherst by a score of 64 to 6, and Williams by a score of 10 to 6, but Dartmouth was defeated by Wesleyan by a score of 23 to 5. In the middle Western group, Chicago University secured the first place by defeating the University of Michigan by a score of 12 to 11, each having been victorious over all other competitors until they met. In the Western Intercollegiate Football Association, the University of Nebraska held the first place, having defeated the Universities of Kansas and Missouri by a score of 18 to 6 and 47 to 6 respectively. To entitle a college or university team to a place in the first class of football elevens it is required that they shall not only play a good game with one of the teams in that class, but shall occasionally defeat the latter. In 1898 the first class included Harvard, Princeton, Pennsylvania, and Yale; the second, Cornell, Carlisle, West Point, Chicago and Michigan, and the third, Wesleyan, Brown, Oberlin, Williams, Dartmouth and Amherst. The last three constituted the New England League. The general opinion in regard to the football playing of 1898 was that it was, on the whole, characterized by fairness, and few men were disqualified by rough play.

FORESTERS, ANCIENT ORDER OF, a fraternal society founded in England in 1745, and in America in 1839. There are in this country 3 high courts, 391 subordinate courts, and 37,108 members. High chief ranger, Edward Lightfoot, Portland, Conn.; high court secretary, Robert A. Sibbald, Park Ridge, N. J.; high court treasurer, Richard P. Shephard, New Haven, Conn.

FORESTERS, INDEPENDENT ORDER OF, a fraternal society founded in 1874, has now 36 high courts, 4,000 subordinate courts, and 140,000 members. Since 1874, \$5,959,240 has been disbursed, and in its last fiscal year \$992,225. Supreme chief ranger, Oronhyatekha, Toronto, Ontario; vice-chief ranger, Victor Morin, Montreal; secretary, John A. McGillivray, Toronto; and treasurer, Harry A. Collins, Toronto.

FORESTERS OF AMERICA, a secret society founded in 1864, reorganized in 1889, consists of 21 grand courts, 1,290 sub-courts, and 142,605 members. During its last fiscal year it disbursed \$782,485, and since its organization \$5,908,918. Supreme chief ranger, J. A. Shaw, Brooklyn; supreme sub-chief ranger, J. F. Kelly, Jersey City; supreme treasurer, T. F. Donahue, Providence; and supreme secretary, E. M. McMurtry, Brooklyn.

FORMALDEHYDE. During the past five years formaldehyde and its derivatives have been thoroughly tested and are now extensively used as disinfectants. Formaldehyde was first obtained by Von Hoffmann in 1868, from wood alcohol. It is a gas. Dissolved in water in the strength of a 38 or 40 per cent. solution it is sold in the shops under the name formalin. A polymer of formaldehyde occurs in a solid form under the name paraform. Most of the adverse testimony presented during the past year has been from those who used the vapor of formalin, or who used formaldehyde gas unaccompanied by moisture, or in cases where exposure of the infected

substances was too brief. Two methods have been chiefly employed. Trillat's method attempts to prevent the formation of polymers of formaldehyde by adding calcic chloride. His generator is called Trillat's autoclave. Its cost and weight are objections against it, and the results are far less satisfactory than those obtained from the simple alformant lamp of Schering. By the Schering method paraformaldehyde (paraform) is converted into formaldehyde gas by the action of the hot, moist products from the combustion of methylated spirit upon the paraform tablets. The probability is that by both methods the greatest part of the formaldehyde escaping into the air is converted into polymers. Schlossmann and Walter prevent polymerization by the use of glycerine, a hygroscopic substance. Ligner has constructed an apparatus which consists of a vessel, in which the water is boiled, so arranged that steam rises from it into a reservoir which contains 40 per cent. of formaldehyde and 10 per cent. of glycerine. This mixture is termed glycoformal. From this reservoir four pipes pass out into the room to be disinfected, which is rapidly filled with a mixture of formaldehyde, steam and glycoformal. A room of 60 cubic metres is so filled with vapor in ten minutes that an electric light in its centre is no longer visible. Microbes are killed in three hours at the longest. This process takes 4 lbs. of formaldehyde to every 1,000 cubic feet of space. The advantages are that sterilization is complete and absolute; closure of cracks is unnecessary; only three hours are required; there is no danger of explosion; the method is cheap; the glycoformal vapor is heavier than air, sinks and covers all surfaces thoroughly; and the total disinfecting powers of the gas are obtained. After the stated time has elapsed, the windows of the room are thrown open for a half hour. Then a solution of ammonia is placed in a vessel in the room, which is again aired, and all smell will be found to have vanished. This method is easily used by the unskilled. Live guinea-pigs and rabbits left in a room during this process of disinfection were found to be uninjured, while bacteria in their skins, their bedding, straw, etc., were killed. Formaldehyde has uninjurious effects on clothing, fur, feathers, paper, leather, photographs, india rubber or metal goods. It fixes blood spots, pus stains and other stains, but only slightly when they are very old. Disinfection is more rapid and certain in warm weather, when the room is warm and dry. Bed clothing must be hung up loosely, otherwise it is not sterilized on the interior surfaces. Reliance must not be placed upon the action of formaldehyde through more than one thickness of cotton cloth; but frequently test objects have been killed through one or two thicknesses of blanket during the ordinary time of exposure. Books may be satisfactorily disinfected in an ordinary steam chamber by formaldehyde gas. They must be stood widely open on perforated wire shelves, about a foot apart. Bindings, illustrations and print are in no way affected by the formaldehyde gas.

Schering's apparatus consists of a metallic cylinder with a receptacle for the pastils at its upper end, and a spirit lamp at its lower end. Each pastil consists of one gramme (15 grains) of formalin, and contains 100 per cent. of formaldehyde. This may be placed in a room upon the floor, or in a metal sterilizer in which instruments have been put for disinfection. Accordingly to many experimenters, 2 formalin pastils, of 1 gramme each, for every 35 cubic feet of room space, destroyed anthrax tubercle, diphtheria and typhoid bacilli, streptococcus pyogenes and staphylococcus pyogenes aureus (the bacteria of suppuration) as well as other bacteria in a few hours. In Schering's sterilizer, with an air space of less than one cubic foot, the vapor from 5 grains of paraform will kill anthrax or staphylococcus in 10 minutes, as shown by Reik and Watson, in *Johns Hopkins' Hospital Bulletin*. Dr Schweinitz and Burnett, of Washington, are authorities for the statement that instruments are not dulled by the sterilization. Park, Bacteriologist to New York Health Department, endorses the favorable reports on disinfection of dwellings, bedding, carpets, clothing, upholstery, etc., and advocates this method for disinfection of ambulances and other conveyances which can be tightly closed, formaldehyde gas to be used in the proportion of 10 per cent. by volume, the time of exposure to be not less than one hour.

FORMALIN, AS A REAGENT FOR BLOOD STUDIES. For general laboratory use formalin is an excellent preservative and fixing agent. It is less expensive and more easily operated than osmic acid. It causes no appreciable distortion of the cells and does not interfere with staining. The method used is as follows as reported by Prof. Kizer, of the biological laboratories of Purdue University:

"A quantity of freshly drawn blood, before coagulation has taken place, is mixed with at least three times its volume of a two per cent. formalin solution. After allowing the mixture to stand at least one hour, a drop from the bottom of the vessel is placed upon a cover-slip and a second cover-slip is pressed lightly upon it; then the two are separated and the liquid is allowed to evaporate. The dried cover-slip is pressed lightly upon it; then the two are separated and the liquid is allowed to evaporate. When cool, dip once or twice into a 5 per cent. solution of acetic acid. After removing the acetic acid with water, stain. If the corpuscles are nucleated, it is best

to use some contrast stain, as haematoxylin and eosine or methyl green with eosine or safranin. If an alcoholic stain is to be used, the films must be washed with alcohol before staining. Non-nucleated cells do not require a contrast stain. Human corpuscles may be stained with Ehrlich's triple stain. Remove excess of stain with water or alcohol as stain requires. Remove alcohol with xylol, clove oil, or turpentine. Mount in Canada balm."

The blood used in Kizer's studies was taken from the cat, chicken, ox, pigeon and man. Human corpuscles seemed to resist all stains until the films were treated with dilute acetic acid. The acid seemed to Kizer to clear the films and to cause the stain to become effective.

FORMOSA, an island lying off the coast of China, which was ceded by the latter power to Japan by the Treaty of Shimonoseki in 1895 after the war between China and Japan. It has an area of 13,541 square miles and a population estimated at nearly 2,000,000. Its chief towns are Taiwan-Fu, Tamsui, and Auping. The first two of these are open to foreign trade, as are also Takow and Kelung. The chief products are tea, sugar, rice, camphor, and coal. Large quantities of tea are shipped to the United States, and the production of this article has greatly increased since 1872. The Formosan Oolong has largely superseded the Amoy Oolong, which formerly controlled the market. It was found that the Formosan product was superior to the Chinese, and the Amoy merchants devoted themselves to the development of the Formosan trade. Rich new fields were opened, resulting in a great increase of production and a lowering of the price. After a while, however, the natives learning the high reputation of the Formosan Oolong, mixed with it the inferior product from the mainland and sold the tea, thus adulterated, as Formosan Oolong. Later the legitimate trade has greatly benefited from a law empowering a commission to reject the adulterated tea and the various grades of Formosan Oolong are now sent to the American market unmixed with the coarser quality of tea.

The Japanese conquerors showed considerable activity in the building of roads and the development of internal trade, but their work was checked by the insurrection of the natives in 1896. During 1897 the administration of the island was reorganized with beneficial results.

FORUM ROMANUM. See **ARCHÆOLOGY** (paragraph Italy).

FORZINETTI; Major, was the governor of the Cherche-Midi prison, one of the military prisons of Paris, in which Alfred Dreyfus was confined. In November, 1897, he published an account of the conduct of the prisoner during his confinement, and in this he said that in spite of all attempts to browbeat him, and in spite of frequent cross-examinations, Dreyfus maintained his innocence to the last. Forzinetti firmly believed that he had been unjustly condemned. It was he, too, who denied the existence of a confession by Dreyfus. See **FRANCE** (paragraphs on History).

FOSSIL BOTANY. The investigations in palæobotany, carried on or completed during 1898, are marked by the discovery of a large number of new species. Of the species described from the United States, 18 are from the Fayette formation; 12 from Florissant, Col.; 21 from the Lower Cretaceous of the Black Hills, and 1 from the Cretaceous of Staten Island.

The small number of text-books on palæobotany has been added to by the appearance of Vol. I of A. C. Seward's *Fossil Plants for Students of Botany and Geology*. The recently issued bulletin of the U. S. Geological Survey, by F. H. Knowlton, entitled a *Catalogue of Cretaceous and Tertiary Plants of North America* contains many new names.

D. White has described a new Lepidodendroid genus, *Ompholophloïos*.

FOSTER, JOHN WILSON, ex-Secretary of State, was appointed a member of the Anglo-American Joint High Commission which was created in May 1898. He was born in Pike county, Indiana, March 2, 1836; was graduated at the Indiana State University in 1855, and after a course of law at Harvard, was admitted to the bar and began to practice in Evansville, Ind. Upon the breaking out of the Civil War he entered the Union service as a major of volunteers, and at the close of hostilities had risen to the rank of brevet brigadier-general. He then became editor of the *Evansville Daily Journal*. President Grant appointed him minister to Mexico in 1873, the appointment being reaffirmed by President Hayes; he went as minister to Russia, 1880, and to Spain, 1883. Upon his return from the latter country he began the practice of law in Washington, D. C., and has since been a resident of that city. In November, 1890, he began a work in which he showed marked ability, namely, assisting President Harrison and Secretary Blaine in the negotiation of reciprocity treaties. He assisted in settling our dispute with Chile, and in the Behring Sea controversy he was appointed to conduct the case for the American government before the arbitration tribunal. Mr. Foster succeeded to the secretaryship upon the death of Mr. Blaine. In December 1894, he was requested to act as legal adviser to the Chinese plenipotentiaries who were negotiating for peace with

Japan. The government of the latter country acquiesced in the appointment, and Mr. Foster accepted. He returned in July 1895; much credit was given him for the prompt negotiation and ratification of the treaty of Shimonoseki.

FOUNDATIONS. See BRIDGES, TALL BUILDINGS (paragraph Foundations).

FOURNIER, HUGUES MARIE, French diplomatist and politician, died December 5, 1898. He was born in Paris, July 29, 1821. He was minister at Stockholm in 1862, ambassador at Constantinople in 1877, and was elected to the Senate in 1879.

FOWLER, SIR JOHN, K. C. M. G., LL. D., a well known hydraulic and railway engineer, died November 21, 1898. He was born near Sheffield, England, in 1817. Having been educated as an engineer, he constructed a number of important railway lines, and when twenty-seven years of age undertook the construction of the group of roads known as the Manchester, Sheffield, and Lincolnshire. He settled in London and was constantly engaged in engineering work. He was appointed in 1870 a member of the commission which was sent by the Indian government to Norway to investigate the railway system in that country. For many years he was consulting engineer to the Egyptian government, and for services rendered in Egypt and in the military campaigns in the Soudan he was made a Knight Commander of St. Michael and St. George. Many important railways, docks, river improvements, etc., including the London metropolitan underground railways, were designed and constructed by him. He will probably be best remembered as the engineer-in-chief of the great bridge across the Firth of Forth. For this work he was made a baronet in 1890.

FRANCE, the most westerly nation of central Europe has an area of 204,092 square miles, with a population on March 29, 1896 of 38,517,975, exclusive of Algeria and the colonies. According to the latest figures available in 1898 the colonies, protectorates, dependencies and spheres of influence of France had an area of 3,617,327 square miles and a population of 52,643,000. The chief cities of France are Paris with a population in 1896 of 2,536,834; Lyons with 466,028; Marseilles with 442,239; and Bordeaux with 256,906. The slow increase of the population of France makes its vital statistics a matter of special interest. The statistics in 1897 give an excess of births over deaths of 119,000, which was due to a falling off in the death rate. In the previous year both the number of deaths and the number of births were in excess of those in 1897. The slow increase of the population of France is due to the low birth rate. The number of emigrants is comparatively small. Out of a total of 285,873 French emigrants from 1857 to 1891, 59,304 went to the United States. During the year ending June 30, 1898, the number of emigrants from France to the United States was 1,989.

Production.—Of the vegetable products of France the most generally cultivated are, among grain crops, wheat, oats, rye, barley, maize and buckwheat, and among green and other crops, potatoes, beet root, grass and hay, clover and wine. The wheat production of France has shown a remarkable increase. In 1895 the area under wheat was 7,100,669 hectares and the crop amounted to nearly 120,000,000 hectoliters. In 1896 the area under wheat was 6,874,000 hectares and the crop amounted to 110,742,000 hectoliters. Wheat is exported, but France imports many of the other cereals although the value of such imports fell from 532,000,000 francs in 1891 to 162,000,000 francs in 1895 and to 123,000,000 francs in 1896. The manufacture of beet root sugar has greatly increased and the number of acres devoted to the raising of the raw product and the quantity of the raw product itself have steadily advanced. In 1896, 84,846,000 quintals of beet root for sugar were raised, a considerable increase over the previous year. In 1896 the production of flax seed and flax fibre each showed a falling off from the returns of the previous year. In 1896 there were 145,310 persons engaged in the silk culture, a falling off as compared with the previous year, and there was a considerable decrease also in the value of the cocoons exported and raw silk produced. It was reported at the beginning of 1898 that the outlook for the year's crops was very favorable and that a considerable percentage of increase would take place in most of the departments in the acreage under crop. The vintage of 1896 was an unusually good one and showed a considerable increase over the quantity for 1895 as well as over the average crop of the previous ten years. The report on wine production for the year 1897, however, showed that the average yield was 180 gallons per acre, which was about one-third less than in 1896, and that the total yield was less than the product of the latter year but about equal to the average for the ten years just preceding. The total yield for 1897 in all Departments was 727,791,000 gallons. The yield in 1875 was greater than it ever was before or has been since. Nevertheless, according to the statistics of wine production for 1897 in the seven chief wine producing countries of Europe, France stood at the head with Italy second and Spain third. On December 31, 1896, there were in France 2,489,658 horses; 260,521 asses; 208,791 mules; 13,334,631 horned cattle; 21,190,603 sheep; 6,402,370

wine; 1,499,005 goats, being an increase over the previous year in all except mules and goats. The chief mineral products of France are coal and iron. In 1895 the production of coal and lignite was 28,019,893 tons, of iron ore 3,679,767 tons, of pig iron 2,003,860 tons, of finished iron 756,793 tons, and of steel 714,523 tons.

Commerce.—In respect to trade France is one of the leading nations of the world. The French statistics divide the foreign trade into two classes, first the general trade, including all goods entering or leaving France and second, the special trade, including only imports for home use and exports of French origin. During the calendar year 1896 the imports and exports falling under the head of general commerce were in round numbers of the value of 4,929,000,000 francs and 4,594,000,000 francs respectively, in each case an increase over the previous year though not up to the annual average for the period 1891 to 1895 inclusive. Special commerce in 1896 included importations to the value of 3,799,000,000 francs and exportations of 3,401,000,000 francs. In 1898 a good deal of comment was caused by the falling off in the exportations. During the first half of the year 1898, while the imports showed a considerable increase over each of the two half-yearly periods preceding the exports fell off seriously. Efforts were made to ascertain the cause of this decrease which was viewed with some alarm because of its probably injurious effect upon French manufactures. It has been attributed in part to the fact that France has lost some of her foreign markets, which have become independent or have established protective tariffs excluding French goods. In 1898 a report of the French Bureau of Statistics and Commerce drew attention to the decrease of French exports and plans were discussed for the extension of the French foreign trade.

Labor Interests.—In July 1898 a law came into effect providing compensation for workmen in cases of accidents which caused disablement for more than four months. In case of complete and permanent disablement the workman receives an amount equal to two-thirds of the wages; in case of permanent partial disablement one-half of the diminution of wages which is caused by the accident; in case of temporary disablement one-half of the wages which the laborer was earning at the time of the accident; in case of death from accident an annuity of one-fifth of the wages to the surviving wife or husband or certain allowances to the surviving child or children, or if there is no surviving parent or child, a certain allowance to relatives dependent upon the deceased. See SOCIALISM, STRIKES AND LOCKOUTS, and WAGES.

Finance.—The chief sources of the ordinary revenue are the direct and indirect taxes and the state factories and monopolies. Of the direct taxes, according to the budget estimates for 1898, the most productive were trade licenses, the real property tax on houses and land, the personal and property tax and the tax on doors and windows. Of the indirect taxes, which yielded according to the estimates for 1898, 59 per cent. of the revenue, the most productive were the customs duties, the tax on spirits, the tax on sugar and the registration tax. The government monopolies and factories include tobacco, posts, telegraphs and telephones, matches and gunpowder and a considerable revenue is derived from the state domains and forests. The chief branches of expenditure according to the budget estimates for 1898 were the service of the public debt, the maintenance of the army and of the civil administration. The budget estimates for 1898 give the total revenue at 3,413,916,088 francs and the total expenditure 3,413,780,536 francs. In 1898 the Brisson cabinet proposed to substitute a new source of revenue for the personal property tax and the tax on doors and windows but was retired before anything was decided upon. On January 1, 1896, the national debt was placed at 31,094,356,744 francs.

Currency.—France is a member of the Latin Union, according to the terms of which the gold and silver coins of the five contracting states are of the same fineness, weight and value. The gold coins commonly used are the 20 and 10 franc pieces and the silver coins are the 5, 2, 1 and $\frac{1}{2}$ franc pieces and 20 centime pieces. France takes a monetary census every six or seven years and according to that of September 15, 1897, the total value of the specie in France was 6,375,000,000 francs, of which 1,935,000,000 francs consisted of 5 franc silver pieces, 240,000,000 francs of divisional silver coin and 4,200,000,000 of gold coins. Of the total amount, 5,260,000,000 francs were in French coin.

Army.—There is universal liability to military service for Frenchmen between the ages of 20 and 45 who are not declared unfit. The budget for 1898 placed the peace strength of the French army at 546,044 officers and men; the army in Algeria at 55,911 officers and men; and the army in Tunis at 13,458 officers and men, making a total of 615,413. It was estimated that the total strength on a war footing, including the reserve and territorial forces, was 4,670,000 men. Besides the active army, in which three years service is required, there is the reserve of the active army with ten years service, the territorial army with six years, and the reserve of the territorial army with six years. A plan of gradual reorganization was being

carried out in the year 1898 in accordance with the law of 1897. One effect of this will be to increase the infantry on a peace footing by 50,000 men.

Navy.—France has one of the strongest navies of Europe, ranking, it is said, next to Great Britain in this respect. Naval management is under the Minister of Marine. The navy is recruited partly by conscription and partly by voluntary enlistment. At the close of 1897 the following figures were given for the navy: 18 first class battleships, 10 second class, 9 third class; 16 port defense ships; 11 first class cruisers, 14 second class, 2 third class; 12 lookout ships; 13 gunboats; 119 first class torpedo craft, 78 second class, 45 third class. There were in process of construction at the close of 1897, 2 battleships; 15 cruisers; 2 lookout ships; 6 torpedo gunboats; and 13 torpedo craft of the first class.

Among the armored vessels recently built or in process of construction may be mentioned the Iena and the Bouvet, each of over 12,000 tons burden; the Charles Martel, Carnot, Charlemagne, Masséna, Brennus and Jeanne d'Arc, each between 11,000 and 12,000 tons; the Hoche, nearly 11,000 tons; the Henri Quatre, nearly 9,000 tons; and the Bouvines and Tréhouart, between 6,000 and 7,000 tons. There was great activity in France in naval affairs especially in the autumn when the Fashoda incident threatened to involve the country in a war with Great Britain. The principal squadrons were reconstituted and the work of preparing the fleet for war was begun.

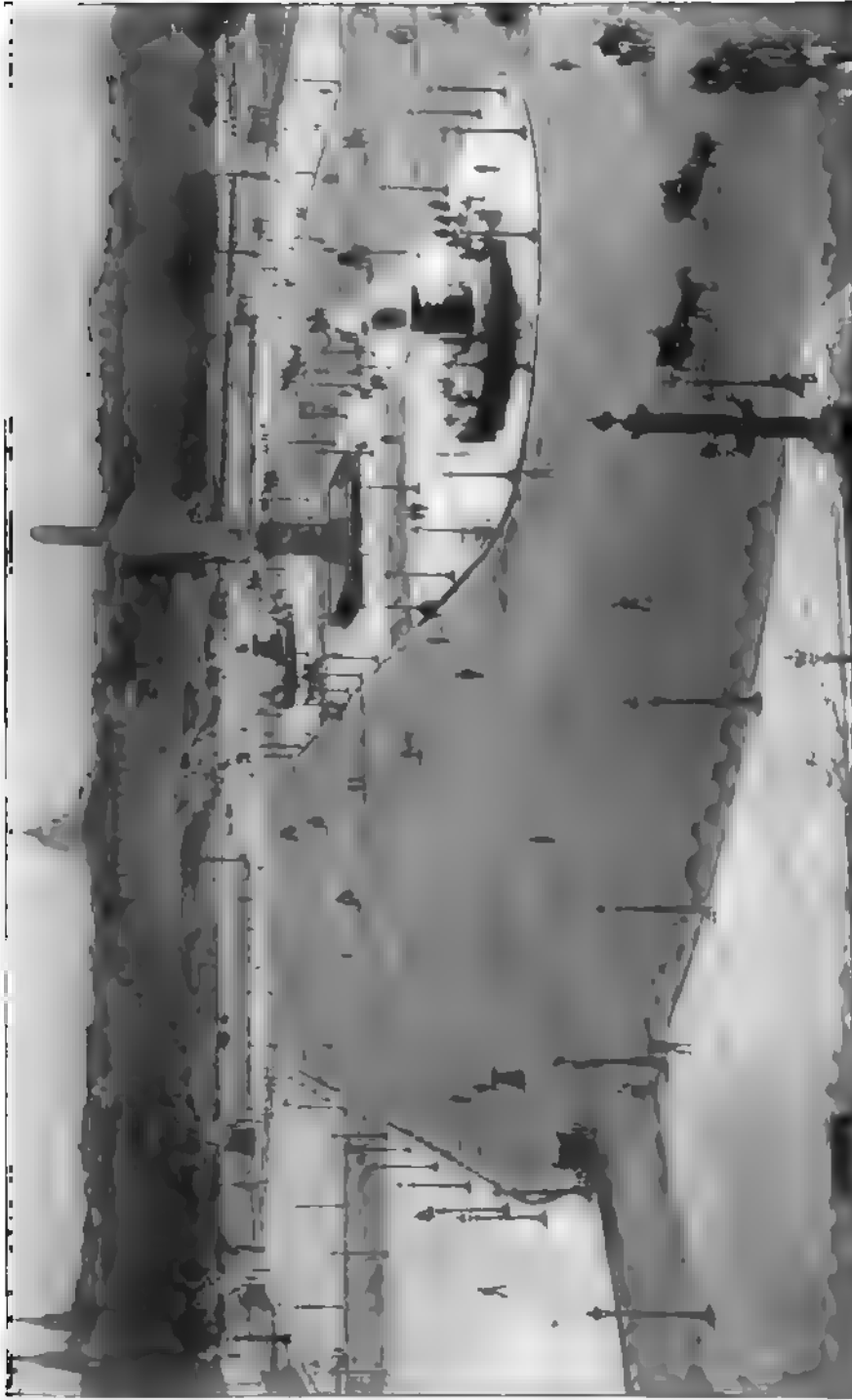
Colonies.—The French colonies include: in Asia, French Indo-China, Anam, Cambodia, Cochin China and Tonquin; in Africa, Algeria, French Congo and Gaboon, French Soudan, Senegal, Guinea, Dahomey, Madagascar and Tunis; in America, French Guiana, Martinique, Guadeloupe and dependencies, St. Pierre and Miquelon; in Australasia and Oceanica, New Caledonia and dependencies and the Society Islands. The special trade of France with her colonies was estimated in 1896 at 359,000,000 francs for imports and 346,000,000 francs for exports and it was said that 41 per cent. of the imports into the colonies came from France and 43 per cent. of the exports from the colonies went to France. Algeria had the largest commerce of all the French colonies and the trade with France, which was valued in 1896 at nearly \$83,000,000, was about three times that with other nations; the chief articles of export were wine and sheep. Madagascar, though larger and more populous than Algeria, had a comparatively small trade. The American colonies of France, though comparatively small, have a valuable trade, especially Martinique and Guadeloupe. Further details in regard to the most important of the French possessions will be found in the separate articles on the colonies themselves.

HISTORY, 1898.

In 1898 the two topics that overshadowed all others in the discussion of current French politics were the Dreyfus affair and the relations with Great Britain. For this reason a large proportion of this review is taken up with these matters, and especial attention is given to the former as the more complicated and the more persistently thrust upon public notice.

The Conviction of Dreyfus.—In the autumn of 1894 Captain Alfred Dreyfus, an officer in the French army, was tried and convicted by a secret court-martial of having sold or given secret military information to a foreign power, presumably an enemy of France. The sentence was very severe. He was degraded in the presence of the army (January 4, 1895) and imprisoned on the Isle du Diable near the coast of French Guiana. During his trial and afterwards he constantly protested his innocence, and there was soon a widespread suspicion that unfair methods had been employed in his prosecution. The power to which he was said to have sold the military secrets was presumed to be Germany, but the German government repeatedly gave assurance that no communication had ever been received from Dreyfus. Thus there arose a conviction that Russia was the power that had received the secrets. Captain Dreyfus was transported March 10, 1895, and for two years comparatively little was heard of the matter, but in the autumn of 1897 rumors arose to the effect that some one was about to prove his innocence, and for several months the Dreyfus affair was the centre of public attention.

The Bordereau.—In November 1897, Mathieu Dreyfus, the brother of the convicted officer, claimed to have found proofs that the document which Captain Dreyfus was charged with writing was in reality written by Major Esterhazy. This document, known as the *bordereau*, in which the writer imparted the secret information to the foreign government now became the subject of constant discussion. It was seen that the handwriting was strikingly similar to that of Major Esterhazy, whose record as an officer and as a man was such as gave grounds for suspicion. He was said to be greatly in debt and not above resorting to unscrupulous measures to escape from his embarrassment. The handwriting experts gave different opinions as to the authorship of the *bordereau*. Esterhazy immediately denied the authorship



THE PALACE OF THE MINISTRY OF FOREIGN AFFAIRS IN PARIS.—In the foreground (Place de la Concorde) stands the obelisk presented to Louis Philippe by Mohammed Ali, Viceroy of Egypt. Beyond, the Pont de la Concorde leads to the Palais Bourbon, now the Chamber of Deputies. Still beyond may be seen the dome of the Invalides, under which Napoleon I. is buried. On the right is the Palace.

and every other point in the charges made by the friends of Dreyfus. A mysterious veiled lady now figured in the case. Esterhazy claimed that this person had placed in his hands definite proofs of the guilt of Dreyfus.

The Zola Letters.—Early in December, 1897, Major Esterhazy applied for a court-martial. The court-martial was opened on January 10, 1898. It was conducted publicly until Lieutenant-Colonel Georges Picquart appeared as witness. The doors were then closed and the council continued in secret session until the verdict was announced on the following day. It was a unanimous vote for the acquittal of the defendant. Now the case took on its most dramatic aspect with the appearance of the novelist Zola as a champion of Dreyfus. On January 13, *L'Aurore* a daily paper edited by M. Perreux, published a letter of Zola's in which he accused by name the officers of the army and the members of the war office of deliberately falsifying in the Dreyfus case. He claimed also the complete innocence of Dreyfus. This remarkable document, known as the "I accuse" letter, from the frequent repetition of that phrase, abounds in the most sweeping statements and the most fiery language. The following passage is worthy of citation:

"I accuse Lieutenant-Colonel du Paty de Clam of having been the diabolical workman of judicial error,—unconsciously I am willing to believe,—and of having then defended his calamitous work, for three years, by the most guilty machinations.

"I accuse General Mercier of having made himself an accomplice, at least through weakness of mind, in one of the greatest iniquities of the century.

"I accuse General Billot of having had in his hands certain proofs of the innocence of Dreyfus, and of having stifled them; of having rendered himself guilty of this crime of *lèse-humanité* and *lèse-justice* for a political purpose, and to save the compromised staff.

"I accuse General de Boisdeffre and General Gonse of having made themselves accomplices in the same crime, one undoubtedly through Clerical passion, the other perhaps through that *esprit de corps* which makes of the war offices the Holy Ark, unassailable.

"I accuse General de Pellieux and Major Ravary of having conducted a rascally inquiry—I mean by that a monstrously partial inquiry—of which we have, in the report of the latter, an imperishable monument of naive audacity.

"I accuse the three experts in handwriting, Belhomme, Varinard, and Couard, of having made lying and fraudulent reports, unless a medical examination should declare them afflicted with diseases of the eye and of the mind.

"I accuse the war offices of having carried on in the Press, particularly in *L'Eclair* and in *L'Echo de Paris*, an abominable campaign, to mislead opinion and cover up their faults.

"I accuse, finally, the first council of war of having violated the law by condemning an accused person on the strength of a secret document, and I accuse, the second council of war of having covered this illegality, in obedience to orders, in committing in its turn the judicial crime of knowingly acquitting a guilty man."

Effect of Zola's Accusations.—Naturally enough this letter created a great sensation. The friends of Dreyfus believed that a malicious conspiracy had been formed against Captain Dreyfus. On the other hand, the supporters of the army held firmly to belief in Dreyfus's guilt. One of the most respected of French citizens, M. Scheurer-Kestner, after studying the proofs for a long time, declared his belief in the complete innocence of Dreyfus. A few days after the publication of the letter, General Billot made a formal complaint against Zola, and Perreux, the manager of *L'Aurore* and it was understood that they would be prosecuted by the government in a short time. Popular indignation rose to a perfect frenzy. France had not seen such an exhibition of fanaticism and popular madness since the days of 1848. The reason for this was threefold. In the first place the agitation against Zola and the friends of Dreyfus was due to the feeling that the army had been insulted. To attack the honor of the army was regarded as no better than treason, for the success of France and her safety from attack depended solely on the strength of her military, and to declare the existence of such widespread corruption among its chiefs was to disorganize and demoralize the whole force. In the second place, it was believed that the relations of France with a friendly nation were involved; and finally Dreyfus being a Jew, Anti-Semitic sentiment was called into play. The main point of Zola's charge was that Dreyfus was convicted by means of a secret document which he was not allowed to see. To the world at large this seems so gross a violation of justice that popular acquiescence in it is hardly credible; but to the French people any means of convicting Dreyfus seemed righteous. The attitude of the war office and the government generally was explained by the claim that a full exposure of the grounds of conviction or the reopening of the Dreyfus question would involve France in difficulties with a country with which she was at peace. The question of reopening the Dreyfus case came up in the Chamber

of Deputies and the government declared officially that the case should never be opened. M. Méline said, "There is no Dreyfus case and can be none," and the Minister of War, General Billot appeared before the deputies and repeated this assurance. He said, "For myself in my soul and conscience as a soldier and chief of the army I regard the sentence as just. Dreyfus is guilty."

The Government's Attitude.—Thus it was evident that every effort would be made by the government in the trial of Emile Zola to suppress all attempts to exculpate Dreyfus, and this was shown by the selection of the passages in the letter on which the charge against Zola was based. The passages were as follows:

"A council of war has just dared to acquit an Esterhazy in obedience to orders—a final blow at all truth, at all justice. And now it is done! France has this stain upon her cheek; it will be written in history that under your presidency it was possible for this social crime to be committed.

"They have rendered an iniquitous verdict which will weigh forever upon our councils of war, which will henceforth tinge all their decrees with suspicion. The first council of war may have been lacking in comprehension; the second is necessarily criminal.

"I accuse the second council of war of having covered this illegality in obedience to orders in committing in its turn the judicial crime of knowingly acquitting a guilty man."

From this it appears that the government based its charges solely on those passages which related to the trial of Major Esterhazy, ignoring the most vital points in the letter of accusation. A second letter from M. Zola complains of this and taunts the government with cowardice, saying that it feared an open discussion and sought to tie his hands. This was undoubtedly the aim of the government.

Attitude of the Defense.—The defense was firm in its resolve to force the Dreyfus matter again upon the public notice. Many thought that it would be successful. The government seemed to give a chance for this by quoting the passage of Zola's letter which charges the second council of war (*i. e.* the Esterhazy court-martial) with attempting to cover the illegality of the previous trial, for it was hard to see how the defence could maintain this statement if it was not allowed to prove that the previous trial, that is the trial of Dreyfus, was illegal. Even if the defense were confined to a discussion of the Esterhazy affair it was clear that they could point to some rather damaging facts in regard to the government's trial of the case. Esterhazy, in his private letters, had declared that he wished he were a German Uhlan and admitted that he was in such desperate circumstances that he was ready to commit a crime in order to obtain money. He was, furthermore, a man of irregular life and so beset by pecuniary difficulties that he was constantly seeking aid from prominent Jews in Paris. He was said to have declared that he hoped "soon to see all those ignorant and cowardly chiefs of his go to people German prisons," and that it "would be an immense delight to put to slaughter 150,000 Frenchmen as a captain of Uhlans." Nevertheless at the time of his acquittal he was congratulated on all sides. As he left the building in which the trial was held his fellow officers stood in line and raised their hats as he passed, and outside the building he was surrounded by crowds of enthusiastic people.

The Anti-Dreyfusards.—Besides the almost fanatical reverence of the French for the army, another and more important reason accounts for the singular excitement over the Zola-Dreyfus case. It was a part of the Anti-Semitic movement which had been gathering force in France for several years. The spokesman of this crusade was M. Drumont, the editor of *Libre Parole*, a somewhat unprincipled sheet which never ceased to pour out abuse against the Jews. It was believed on all sides that a powerful Jewish conspiracy existed for the betrayal of France, that Dreyfus had many accomplices and that in their anxiety to disprove his guilt and save themselves they had plunged into another conspiracy against an innocent man. The charges against Esterhazy were thought to rest mainly on the treachery and malice of this Jewish syndicate. So the Zola trial brought on a most extraordinary outburst of religious bigotry. Riots occurred in the streets and the police were obliged to guard the homes of prominent Jews. Some of the Clericals went so far as to suppose or pretend that Protestants had allied themselves with Jews in this traitorous project. Anti-Semitic and Anti-Dreyfus demonstrations occurred in Paris and throughout France. In Algeria the riots took even a more violent form and resulted in the killing of several persons. When Zola appeared in defense of Dreyfus he became the centre of public attacks. Cries of "Down with Zola," "Spit on Zola," "Long live the Army" were heard on all sides. Zola's partisans were equally noisy, but far less numerous. As soon as the Dreyfus matter was broached in the Chamber of Deputies it was the signal for the wildest disorder and the most violent language. On January 23d, the angry discussion in the Chamber culminated in a fight in which both the members on the floor and the spectators in the galleries took part. Troops had to be called in to clear the galleries, and at the end of the session

it is said that over one hundred neckties were picked up on the floor of the Chamber.

The Trial of Zola.—The trial began on February 7th. Zola's counsel was M. Labori, and the well known party leader, M. Clemenceau, defended M. Perreux, the publisher of *L'Aurore*. The same scenes of violence and disorder were repeated in the court room. There were continual cries of "Down with Zola" and "Hurrah for Rochefort," which the efforts of the court were unable to repress. On the first days of the trial it appeared that hardly any of the witnesses summoned for the defense intended to attend the trial. These witnesses were chiefly officers of the army, and members of the war office, and they refused to testify on the ground that the Dreyfus case could not be reopened. Some, however, assigned sickness as the reason, and others the refusal of their superiors to allow them to attend the trial. One of the most important witnesses, Colonel du Paty de Clam, gave no excuse whatever for his refusal to testify. Nevertheless in most cases the court overruled the refusal of the witnesses and obliged them to appear. It was the constant effort of the defense indirectly to bring in the Dreyfus matter, and of the prosecution to forestall and thwart them. According to the ruling of the court Zola was forbidden to prove that Dreyfus was condemned unjustly. The testimony of M. Scheurer-Kestner was very important. He said that he had learned in September 1896, that Colonel Picquart had discovered the identity of Esterhazy's handwriting with that in the *bordereau* and had become convinced that the verdict against Dreyfus was erroneous. The affair was now brought to the attention of General Gonse who at first favored the investigation of the case. Other officers high in authority however refused to admit the possibility of Dreyfus's innocence. Several of them declared on their conscience that Dreyfus was guilty. The army officers summoned to appear at the trial maintained silence in regard to the Dreyfus case. There was no way for the defense to prove the story of the secret document, since the officers refused to testify. Nevertheless the attitude of General Mercier was significant on this point. When asked whether he had submitted a secret document at the Dreyfus trial without the knowledge of the accused and of his counsel, he said that he could not reply to that question. By many this was viewed as an admission that the accusation was correct. All testimony, however, that tended to prove the existence of this secret document was rejected by the court, and it was only incidentally ventilated through the adroit handling of the case by the counsel for the defense. Colonel Picquart testified that he had been constantly hampered in his investigations of the Esterhazy case when these investigations seemed to lead to a proof of Esterhazy's guilt. Experts who had testified in the Dreyfus matter would not reply to M. Labori's questions on the ground that they would be reopening the Dreyfus matter in disobedience to the court's orders, and the military authorities refused to submit the original *bordereau* for comparison with Major Esterhazy's handwriting. But experts called on behalf of the defense testified to the identity of the two.

It is not necessary to go further into the details of the case. As reported in American and English papers, the conduct of the trial was characterized by what, to the Anglo-Saxon mind, appears the grossest perversion of justice. Still it must be said that only Zola's side of the question was stated at length in this country and in England. Little attention was paid to the speeches of the prosecution and very few of them were reported at all. Again several aspects of the trial which seemed to Americans very irregular were characteristic of all French trials. For instance, the privilege accorded to witnesses of digressing from the points at issue for the purpose of making long political or patriotic harangues is characteristic of French legal procedure. Admitting all this, however, it is hard to see the course followed by the government in a favorable light. Public opinion in foreign countries was as unanimous in favor of Zola as public opinion in France was unanimous against him. The chief defense which may be urged on behalf of the French people is their enthusiastic devotion to the army, and their belief that the very existence of the Republic depended upon it. They could not forget that Dreyfus was convicted by a unanimous verdict of seven prominent military officers, and on the testimony of twenty-seven others. They saw in Zola's accusations an attempt to drag in the mud the names of the chief representatives of France and of the army. They cared not whether Dreyfus was convicted on a secret document or not. They believed in his guilt and were willing to trust the chiefs of the army when they refused to make the events of the trial public. The French people honestly believed that the reopening of the Dreyfus case would imperil the Franco-Russian Alliance. The trial lasted fifteen days, terminating February 23, 1898. After a deliberation of forty minutes the jury unanimously rendered a verdict of "Guilty" against Zola and Perreux. The former was sentenced to twelve months, the latter to four months, and each to a fine of 3,000 francs.

Anti-Semitism.—Major Esterhazy was quoted as saying at the time of the Zola trial "If Dreyfus were ever to set foot in France again there would be 100,000 corpses of Jews on the soil. If Zola is acquitted there will be a revolution in Paris. People

will put me at their head in a massacre of the Jews." This is a good illustration of the height to which the popular excitement had wrought itself. The indignation against Zola and Dreyfus gave way to a general hatred to the Jews. The leader of the Anti-Semites was Edouard Drumont of the *Libre Parole*. To him every Jew was an object of hatred and suspicion. The Zola trial was merely a means for furthering the Anti-Semite movement. He professed to find in the Jews the real rulers of French society, working through underhand means, to be sure, but always supreme. He agitated constantly for the repeal of the laws providing for the political equality of the Jew. He would have them set apart by law from the other classes of the community, claiming that they had always remained a race apart, never comprehending the true genius of French life and never sympathizing with the patriotic ideals of their fellow-countrymen. The general tenor of his writings is that the Jews must be proscribed, that if they are not proscribed they will be massacred. He of course believed firmly in the guilt of Dreyfus. Undoubtedly the Jews sympathized with Dreyfus and his friends, but the talk of a Jewish syndicate organized for the purpose of procuring his release, by any means however corrupt, was probably groundless. "There is no syndicate of Jews to free Dreyfus" said Zola, "there is no syndicate of Jews the world over for any purpose." He found in the attacks on the Jews merely the feeling of jealousy on the part of Christians over the superior skill of the Jew in financial matters.

French Opinion of the Case.—The above outline of the Zola trial is based on the information published in the press of this country. It is in the main correct, but there has been a tendency in the presentation of the case both in the United States and in England to ignore the attitude of the opponents of Zola, and it is interesting to note what a prominent French publicist, Baron Pierre de Coubertin, says on behalf of the government. In the first place he holds that whatever may be said of the innocence of Dreyfus, Zola utterly failed to substantiate his charges against the officers of the court martial. He thinks that it is absurd to doubt their sincerity, though equally absurd to doubt the sincerity of Zola, whom he characterizes as an enthusiast, earnest enough but obstinate and lacking common sense. He points out that Zola failed completely to convince even a minority of the French people of the guilt of the court-martial officers. Yet of course it was generally admitted that the trial was irregular. The followers of Zola he characterized as "a handful of second-rate men," men who represented the pessimistic and discontented element of the republic and whose aim was to make mischief and injure the government. In France they had little influence and deserved to have even less, but the result of their misrepresentations was to lead to international misunderstandings. Baron de Coubertin holds that in England and America public opinion went as crazy over the Zola affair as it was accused in those countries of having gone in France. He attributes the lack of sympathy shown by the French in the quarrel between the United States and Spain to the vengeful feelings aroused by the attitude of the American people toward this Zola affair. As to the irregularity of the trial and the unwillingness of the government to open the entire affair to the public, he attributes the evil wholly to the existence of the spy system in Europe. "So long as that spy system exists, it is quite absurd," he says, "to expect a trial of this nature to be publicly prosecuted. No such thing would ever be thought of in Germany, and France would act childishly by doing otherwise."

Renewed Discussion.—In the summer of 1898 the great majority of the French people were still so firmly convinced of the guilt of Dreyfus that they could not tolerate for an instant the thought of re-opening of the question. It was "*une chose jugée*," and anyone who dared to express a doubt of the justice of the court-martial verdict, or hint at a revision of the sentence was liable to social ostracism or even worse. Private citizens were insulted and threatened, civil officers degraded; military men were challenged to fight duels, all for mere expressions of opinion. The great mass of the people had heard enough of the affair, and every effort was made to muzzle the minority. Yet in spite of this the subject was again forced on public attention, and singularly enough by one of the very men who were unalterably opposed to revision. On July 7, M. Cavaignac, Minister of War in the new Brisson cabinet, made a speech, which in all sincerity he believed would convince everyone that Dreyfus was guilty and settle the matter once and for all. Unlike the other ministers who had merely expressed their positive conviction without adducing evidence, Cavaignac gave the grounds for his belief. These grounds were twofold. In the first place, there was an alleged confession of the accused, and in the second place, there were three incriminating documents, one of which mentioned Dreyfus by name, and afforded, it was said, irrefutable proof of his guilt. The speech was a great success, and by a nearly unanimous vote of the Chamber was ordered to be placarded in all the communes of France. But it was soon clear to the opponents of revision that Cavaignac would have done them a greater service if he had either said nothing at all, or adhered to the plan of his predecessors in

merely asserting Dreyfus's guilt without giving reasons. For these reasons were immediately called in question and the whole subject was revived. Cavaignac had blundered, and France again had to listen to the disagreeable discussion. The honor of the army, which somehow was supposed to be absolutely identical with the honor of a few of its chiefs, was now in greater peril than before.

In the first place Colonel Picquart wrote to the Premier M. Brisson, offering to prove in court that two of the documents read by M. Cavaignac had nothing to do with the Dreyfus case, and that the third bore all the marks of forgery. Next came the public assertion of Dreyfus's counsel that the letters had not been shown at the trial, and that therefore the accused had been condemned on evidence with which he was not confronted. M. Cavaignac, whose honesty in the affair has not been called in question now began investigations. The results were very important and most unfortunate from the point of view of those who wished the Dreyfus case be regarded as "*une chose jugée*."

The Documents in the Case.—The famous *bordereau*, the one piece of documentary evidence presented at the trial, was not referred to in M. Cavaignac's speech. He based his belief on three letters two of which had passed between the Austrian military attaché in Paris, M. Panizzardi, and the German military attaché, Colonel Schwarzkoppen, in the spring of 1894, while the third, apparently in the same handwriting, was written in the autumn of 1896. The first two do not mention Dreyfus by name, but refer to a certain mysterious "D." and in one of them appears the passage, "I enclose the plans of (giving the name of a French fortress) which that *canaille de D.* gave me for you." The third document, written in blue pencil, and apparently on the same kind of paper, was given to the authorities by Colonel Henry in October or November, 1896. Colonel Henry had been one of the members of the Dreyfus court martial, and at this time he was at the head of the Intelligence Department, having succeeded Colonel Picquart. He said the document had been given to him by one of his agents, who was employed to spy on the military attachés of foreign governments. The document fitted in admirably with the previous letters, and by giving the name of Dreyfus in full seemed to settle finally the question of identity. It referred to an attempt of the Chamber to interpellate the Government on the Dreyfus case.

Down to the close of 1896, it was supposed that the handwriting of the first two letters was that of Colonel Schwarzkoppen. The third note was presumably his also, for besides the apparent identity of handwriting, there was attached to it one of the Colonel's visiting cards. It contains the following passage. "I have read that a deputy is going to make an interpellation on Dreyfus. . . . I shall say that never have I had any relations with this Jew. That is understood. If you are asked, say the same. Nobody must ever know what has occurred with him." This was the irrefutable proof advanced by M. Cavaignac, in his speech. It was in fact the strongest point in his argument, and if it were disproved, his whole case would fall to the ground. He said "Thus the guilt of Dreyfus is clearly proven by a document of 1896, which perfectly fits in with a previous correspondence, and which demonstrates that guilt in an irrefutable fashion."

Colonel Henry's Forgery.—Now the objections urged at once by the doubters were: First the fact that Colonel Henry, who had always been a bitter opponent of revision, had admitted under oath at the Zola trial, that the document referring to "that *canaille de D.*" had nothing to do with the Dreyfus affair; second, the declaration of Panizzardi and Schwarzkoppen that they never had any relations with Dreyfus; third, the discovery that the handwriting in the first two documents was not that of Colonel Schwarzkoppen, but that of Colonel Panizzardi. This last fact gave color to the suspicion that the third document was forged by some one at the time when it was still supposed that Colonel Schwarzkoppen was the writer of the other letters, and this suspicion was increased by the style in which the last letter was written. It was evidently the work of an illiterate man, while the other letters were in good French, and it was known that both the military attachés were thorough masters of the French language. Finally there was Colonel Picquart's offer to prove that this letter bore all the marks of forgery. The proof of the worthlessness of these documents as evidence of guilt came about in a curious way. An officer who had figured in the Esterhazy inquiry was examining the third letter by an artificial light when he observed that the paper was not exactly the same as that on which the two other letters were written. The matter was brought to the notice of M. Cavaignac, and Colonel Henry was summoned before him to explain. Henry broke down and confessed that he had forged the letter in the autumn of 1896. The object of the crime was not clear. Henry himself merely said that he wished to make sure that the case would not be re-opened, and he did not realize the gravity of the offence. He was taken to prison, and soon after confirmed the sincerity of his confession by committing suicide. He cut his throat with a razor from his dressing

case. Thus the main ground of M. Cavaignac's belief in the justice of the Dreyfus decision was demolished.

Dreyfus's Alleged Confession.—As to the alleged confession of Dreyfus, which was adduced as supplementary proof of his guilt, the evidence appears to have been flimsy. It was said that he had confessed to one Captain d'Attel, but the latter's death made it impossible to obtain first hand testimony to the fact, and the authenticity of the confession rested merely on the alleged statement of this deceased officer, which was passed from one to another until it was reported by the fifth person to whom it was told. It was also said that Dreyfus had confessed to Captain Lebrun-Renaud, who accompanied him on the day of his degradation, but Lebrun-Renaud allowed more than two years to pass before stating that such a confession had been made, and the value of his testimony was impaired by the apparently well founded statement that in the meanwhile he had more than once explicitly denied that Dreyfus had made any statement to him at all.

Testimony of Foreign Officials.—As time passed it was generally admitted, that military secrets had been sold to the governments of Germany and Italy, and that a regular system of espionage was maintained through the German military attaché at Paris. It was thought that as soon as any important military plan was discussed in the war office in Paris it appeared in duplicate at the war office in Berlin, and that this information had been purchased from French officers by the Germans. As the guilt of Dreyfus became doubtful, suspicion pointed to Esterhazy; and in political circles in Germany and France it was believed that Major Esterhazy was in receipt of a regular salary from the German government, and that he employed the services of other French officers. Both Germans and Italians have repeatedly declared their belief in the absolute innocence of Dreyfus.

In the meanwhile the course of the Zola case had been as follows: After the sentence of Feb. 23, appeal was taken to the Court of Cassation, which granted it on April 2, and quashed the verdict. The ground of appeal was that the trial should have been brought, not by the war office, but by members of the Esterhazy court martial. On April 8, the latter decided to push the case against MM. Zola and Perreux, and the second trial began in the Assize Court at Versailles on May 23. After a second appeal by the defense to the Court of Cassation, the trial was suspended, but on July 16, this appeal was dismissed, and two days later the second trial was resumed. The defendants allowed the case to go by default, and again appealed. But the third appeal met with the same fate as the two previous ones. On July 2, Zola left Paris, and afterwards took up his residence in England. On the 9th of Sept., Major Esterhazy fled from France and was said to have hidden himself in London. Both he and Colonel du Paty de Clam were cashiered from the service.

Arrest of Colonel Picquart.—General Cavaignac retired from the cabinet in September, and was succeeded by General Zurlinden, the military governor of Paris. Under the administration of Zurlinden prosecution was begun against Colonel Picquart, who had offended the Anti-Dreyfus people by the zeal which he had shown in his investigations and by his declared belief in the innocence of Dreyfus. Colonel Picquart was placed on trial before the Correctional Tribunal, on the charge of revealing documents concerning the national defense.

When the Picquart case came up before the Correctional Tribunal the public prosecutor asked a postponement on the ground that the Minister of War had ordered the prosecution of the prisoner on the more serious charge of having forged documents. The request was granted and Col. Picquart was transferred to the prison of the Cherche-Midi. On this occasion he caused a great sensation by hinting that this was the last time that he would speak in public. He added that if he should be found dead like Picard the detective, who was found to have been strangled under suspicious circumstances, and like Henry, whose tragic death had recently occurred, it would not be a case of suicide.

Success of the Revisionists.—After the Henry confession the demands for revision were renewed and even in quarters where hostility to Dreyfus was known to exist an inquiry into the facts was desired. After the disclosures of Henry, Gen. Boisdoffre, who had previously staked his honor on the guilt of Dreyfus, resigned saying that his confidence in Col. Henry had been misplaced. Gen. Zurlinden, the successor of M. Cavaignac as Minister of War, resigned on September 17. The revisionist movement was gaining ground and on September 26, the cabinet decided that the demand for revision made by Madame Dreyfus after the revelations in the Henry affair had been made public, should be submitted to the Court of Cassation. This decision of the cabinet was reached after an exciting meeting and was followed by stormy scenes in the Chamber and on the streets. An account of the cabinet crisis and the formation of a new ministry is given in a succeeding paragraph but the main points in the history of the case to the close of the year can be briefly summed up here.

Decision of the Court of Cassation.—Toward the close of October, the Court having appointed a reporter to investigate the demand for revision took up the case for decision. The chief points which had been brought to the notice of the Court were as follows: It was urged that Henry's confessed forgery had invalidated the testimony which he had given in 1894; that expert testimony in regard to the *bordercau* was conflicting and that the letters of Esterhazy indicated that he was the author of that document. The Court decided on October 29 that there was ground for proceeding to a supplementary investigation, that the documents placed in its hands were not sufficient for it to decide on the merits of the case and that pending the supplementary investigation there was no ground for suspending the sentence against Dreyfus. This decision did not require that Dreyfus should be summoned at once to give his evidence, but the court notified him on November 15 that revision proceedings had begun and there was some slight mitigation of the rigors of his confinement. Down to the close of the year public interest centered mainly in the question whether the war department would submit to the Court the secret documents in the case. In the meanwhile Col. Picquart had applied for a decision upon the question whether a military or a civil tribunal should have charge of his case. On December 8 the Court of Cassation decided that the military prosecution should be suspended until after the Court itself had examined the documents. As to the submission of the secret documents in the Dreyfus case to the Court of Cassation, it was reported on December 23 that the war office would deliver them. Such were the main events in the history of the case to the close of the year 1898. Further information will be found in the articles on the persons whose names have been mentioned in connection with the affair.

The Méline Ministry.—The Chamber of Deputies would regularly have been dismissed in the autumn of 1897 but by special law it had been provided that the Chamber of 1893 should remain in session until the month of May, as that time was thought to be more suitable for the elections. The Chamber accordingly came to an end in May, 1898. In the elections that followed no very radical change was made in the composition of the Chamber. The Socialists, Guesde and Jaurés, were not reelected nor was the well known royalist, the Duke de la Rochefoucauld-Doudeauville. The Méline ministry remained in power. This ministry was formed in August, 1896, and its longevity has surpassed that of any ministry that preceded it under the Republic. Méline was the representative of the conservative Republicans whose triumph followed the downfall of the Radical ministry, including such men as Cavaignac, Berthelot and Lockroy, which came into power some eight months after the election of Félix Faure. The Radical party in France has held a rather ambiguous position. Some members of it have been most zealous in their expressions of sympathy with the Socialists, while others have never lost an occasion to attack them. Accordingly the Radical party has not been especially strong in France, and when it has come into power it has usually been a foregone conclusion that its overthrow was not far off. The Méline ministry owed its long life partly to the negative character of its programme. It did not represent the party of progress, nor did it stand for reactionary ideas. It held rather to what might be called a stationary programme, that is, it favored the maintenance of the *status quo* as the best thing for France. Its somewhat composite character and its lack of definite purpose prolonged its life amid the numerous and conflicting party programmes of the hour. There were some who held that a progressive policy in France was likely to be injurious to the maintenance of the Russian alliance. Méline's minister of foreign affairs, M. Hanotaux, has declared that it shall be the policy of the French Republic to "raise above all other cares the care of her alliances." The Russians could hardly be thought to sympathize with progressive ideas in France, and moderate Republicanism seemed best suited to fit the necessities of an alliance with autocracy.

The Brisson Ministry.—In the summer of 1898 the Méline Cabinet resigned, presumably on the ground that the desertion of the Radicals left it too small a majority to accomplish its purposes. In the two weeks from June 15 to June 29 another Cabinet was installed under the premiership of M. Brisson with M. Delcassé Minister to Foreign Affairs in the place of M. Hanotaux. The real motive of the resignation of Méline is hard to determine, but it has been said that he expected or hoped to obtain a stronger majority as a result of the elections in the spring of 1898. Besides this, he probably thought that his influence would be in no way impaired by the intervention of a new ministry. This new ministry was Radical in its composition. One of its leaders was M. Bourgeois, the well-known Radical. Its support in the Chamber was thought to be precarious, and it was not expected to remain in power long.

The Russian Alliance.—The Russian alliance still continued to enthrall the minds of the French people in 1898. Outside of France it was generally believed that the motive of this alliance was the idea of revenge. It was thought that the French favored it because they expected by means of it to regain what had been lost to Ger-

many. The Russian alliance, therefore, was generally regarded by outside nations as a menace to peace. In France itself, however, some of the more conservative thinkers saw in the Russian alliance not so much a menace to peace as a guarantee that peace would be preserved. These writers have held that the French people did not in reality desire war, that in fact to no people in Europe was the idea of war so repugnant. These men have seen in the Russian alliance a bulwark against German aggression. They have, however, for some time expressed a fear that while it would not be France who would draw Russia into war there might be a danger lest Russia would force France into a European struggle. In some quarters there has been apprehension lest the Franco-Russian alliance might draw France into war with England. There are constant dangers of conflict between the two latter powers whose colonies face each other in all parts of the world. But so long as there is a real desire of friendship on the part of the two peoples themselves this danger will be averted. Russian hostility to England, however, may, it is said, imperil the friendly relations of France with their Anglo-Saxon neighbor across the channel.

The World's Fair of 1900.—During 1898 preparations for the World's Fair of 1900 were actively carried on. An army of employees was already organized and foreign governments the world over were sounded as to their intention of coöperating with France in the great exhibition. Most of the foreign governments declared their readiness thus to coöperate and many appointed representatives.

The Niger Boundary Question.—The settlement of the long-standing dispute over the respective boundaries of the British and French colonies in the Niger region was reached by the signing of a convention June 13. This convention was the work of the Anglo-French commission, which had for many months been in session in Paris. For the terms of its agreement, see the article NIGER TERRITORIES.

Cabinet Crisis in October.—On October 25 there was an exciting scene in the Chamber of Deputies and the Brisson ministry was overthrown by a vote of no confidence. The trouble began with a tirade of M. Déroulède against the ministry, especially against the Minister of War, General Chanoine. The latter seems to have completely lost control of himself in his anger at this attack. He repelled the charge of disloyalty to the army, declared that he agreed with his predecessors in the belief that Dreyfus was guilty, and to the surprise of the Cabinet which had no warning of his action, angrily resigned his portfolio. Thereupon followed one of those mad uproars which are not unusual in the French Chamber. The members broke out into howls and soon came to blows. Premier Brisson went into the tribune and at last succeeded in making himself heard. He declared that it was the right policy of the government to maintain the civil power above the military. This affirmation was voted upon by the Chamber and the Government secured a small majority, but the uproar was renewed when a member declared that the Government must put a stop to the campaign against the army. Premier Brisson denied that the army had been insulted and at last the Cabinet demanded a vote of confidence on the question. This motion was lost by a vote of 286 to 234. The excitement spread from the Chamber of Deputies to the streets where the Anti-Semite spirit showed itself in cries of "Down with the Jews!" "Down with M. Brisson!" and "Long live the army!" There was some rioting and an occasional conflict with the police. Great apprehension was expressed in regard to the condition of affairs. Many seemed to think that the Republic was doomed. In the meanwhile, the Fashoda difficulty with England was left unsettled, but in France, war was considered impossible. See EGYPT.

The Dupuy Cabinet.—The Chamber adjourned on November 4. In the meantime there was a discussion with the President in regard to a new cabinet and after several conferences the new ministry was made up. It included as its principal members M. Dupuy as Premier, M. DeFreycinet as Minister of War, M. Lockroy as Minister of Marine, M. Delcassé as Minister of Foreign Affairs, the last named having been retained from the Brisson Ministry. In a declaration of its proposed policy the cabinet affirmed the supremacy of the civil power in the state. At the same time the army was not to be the butt in a campaign of insult, nor was it to find any falling off in the protection and regard to which it was entitled from the public authorities. The attitude toward the Dreyfus affair is suggested by the following sentence: "It is equally necessary that calmness attend the work of justice and our duty is to insure the executions of its decisions whatever they may be." The declarations of the ministry received the applause of the Chamber and approval was voted by a large majority.

The French View of the Anglo-Egyptian Expedition.—The French had watched the Sirdar's movement with the greatest interest. France has always tried to induce the British government to fulfill its pledge to evacuate Egypt. As soon as the Soudan should be regained as the result of Kitchener's expedition, the French urged that England's work would be accomplished and that she ought to evacuate the country directly or at least to set the time at which the occupation would terminate. Little hope, however, was felt that England would see her duty in this light. It is

interesting to read of the motives which French critics assign to her for insisting on remaining. They say that with the exception of a year or two at the beginning of the occupation she has always intended to remain in Egypt. Every year has seen her grasp tightened on the country. There has been too great a sacrifice of men and money to admit of her letting go her prey. The valley of the Nile has virtually been mortgaged to an extent that the Egyptian government can never pay. This mortgage is increased day by day. England must be the mistress of the Suez canal if she is going to prevail in African difficulties or in the questions of the Far East. A French writer prophesied that although England determined to retain Egypt she would not openly proclaim that intention, though she had recourse to the pretext which had previously succeeded, namely, that she could not evacuate the country until she had restored to Egypt that which she had caused her to abandon, and though these provinces were now re-conquered they must be reorganized, policed and opened up by railways and other means of communication. Until this work was accomplished England would remain in Egypt. After it was done and then only would there be any talk of evacuation.

The Fashoda Affair.—After the news that Marchand was at Fashoda reached France (see EGYPT), the Government awaited his report before returning a definite answer to the British demand for the evacuation of Fashoda. In October the danger of war between France and England seemed threatening. In a speech by Lord Rosebery the determination of all Englishmen, irrespective of party, to support the Government in its policy in regard to the Upper Nile was emphatically assured. Lord Rosebery said that there was a disposition on the part of the other European powers to take advantage of the supposed weakness or irresolution of the British government, and that if this went so far as to assume that Great Britain would show any less vigor in the defense of her rights than she had showed in the past, the assumption would prove to be a grievous blunder. Considerable excitement was caused by Lord Rosebery's speech and it was renewed by the speech of Sir Michael Hicks-Beach on October 19. The latter said that it was impossible for France to maintain that she has any political rights at Fashoda. He said that she was justified in waiting for Marchand's report but should she refuse to evacuate Fashoda after weighing all the evidence in the case the result would be most menacing to the friendliness of the two countries. Africa, he said, was big enough for both, for France in the West and Great Britain in the East, and he was confident of a friendly solution of the problem, but should the attempt at amicable settlement fail, he held that there were greater evils than war and that war on such an issue as this would not be feared by Great Britain, since she would go into it with a united people.

France's statement of her case was awaited with great interest in Great Britain. It was made public by the issuance of a yellow book on October 23. The main contention of the British was that in occupying Fashoda France had deliberately done what Great Britain had told her would be regarded as an unfriendly act. This demand on the part of England that France or any other power should keep her hands off in the Upper Nile region had been made by Sir Edward Grey in the House of Commons. The French Premier's answer to this was that the force at Fashoda was not Marchand's mission but Liotard's mission which had been authorized to reach the Nile long before Sir Edward Grey's declaration had been made. As to the rights of the matter, the French yellow book claimed that France had as good a right in Fashoda as Great Britain in Khartoum. France had not accepted England's claim to exclusive control of the Nile Valley and it is stated in this yellow book that M. Hanotaux had protested immediately against Sir Edward Grey's declaration. It was urged by the French that Liotard's mission had been undertaken in 1893 at the time when England considered the Soudan lost to Egypt.

Notwithstanding the French claim to Fashoda, it was stated that France would abandon that place if she could secure as compensation an outlet on the Nile for her African territory. The yellow book contains the correspondence between the two governments and some passages in this show on what delicate ground the negotiators were treading. The British communication dated Sept. 30 warned the French Premier that France in going toward the Nile was taking steps which would bring her into conflict with Great Britain. The French Premier doubted the correctness of this statement and retorted that the French were first at Fashoda, the British not having reached Khartoum until two months later and that to demand the French evacuation of Fashoda was to formulate an ultimatum. The French representative, Baron de Courcel, informed the British government that if France withdrew from Fashoda she would claim the valley of the Bahr-el-Ghazal as the necessary outlet on the Nile for her territories in the Congo basin. This demand was then laid by Lord Salisbury before the British Cabinet. The yellow book was discussed at great length in the British press. The British point of view seemed to be that the French Premier's assumption of equal rights and privileges in the Nile Valley showed a complete disregard of what had happened in that region during the last sixteen years. Englishmen refused

to admit that French and English were standing on a footing of equality there. The presence of French officers on the Upper Nile was regarded as wholly unwarrantable and their right of remaining there was not even to be discussed. The delimitation of the French and British territories was of course a proper subject of negotiation, but it would not be forgotten that England deserved something for her long years of labor and sacrifice in Egypt. The difficult feature of the whole matter at this juncture was the insistence of France on a *quid pro quo* for the withdrawal of Major Marchand—a demand which was especially offensive to the British because the latter regarded his withdrawal as their absolute right, for which no payment could be justly demanded.

The French Point of View.—The French view of the Fashoda affair was not clearly presented in the American account of this difficulty. A writer for the *Revue des Deux Mondes* gives a concise and moderate statement of the French side of the question, which is in substance as follows: The French Chamber met on October 25, 1898, and the ministerial crisis at once occurred. The Brisson Ministry was, as we have seen, immediately overthrown. To the English it seemed as if the French could attach but little importance to foreign affairs if in the presence of the international dispute over the Fashoda affair they could permit the government to fall into disorganization as the result of internal party strife. It seemed as if the Dreyfus case absorbed public attention in France to the exclusion of everything else. This view was not well founded. No matter how much factions might contend over domestic questions, there was virtual unanimity in regard to matters of national importance. There was but one foreign policy in France. M. Delcassé had the nation behind him in his efforts to maintain the rights of France as against Great Britain. He continued in his post as Minister of Foreign Affairs in the Dupuy Ministry that succeeded the Brisson Cabinet, and he maintained the same attitude toward the Fashoda affair. The comment of the French press on the negotiations between the two governments described in the two blue books published by the British government and the yellow book published by the French, was far more moderate than that of the British. In France it was recognized that there was no serious point of difference between the views of the two governments. The conversations between the British ambassador, M. Delcassé, on the one hand and the French ambassador and Lord Salisbury on the other, were reported in much the same terms in the official publications of the two governments. The essence of the controversy was not whether France should retain Fashoda, for on that point France did not insist. France claimed, however, that she had a perfect right to send her expedition to Fashoda. On the other hand, Great Britain claimed that this point of the Nile belonged to Egypt and in consequence was rightfully under the control of Great Britain. The French criticised Lord Salisbury's "picturesque expression" of "dormant rights." He said the Mahdi had held Fashoda by right of conquest, but now that the Mahdi was beaten it belonged to Great Britain. The "dormant rights" had persisted throughout all the revolutions of the Soudan and as the French put it had been re-awakened like the Sleeping Beauty by General Kitchener as Prince Charming. In France it was asked why it was that those rights ceased to sleep for the Mahdi and not for France. But after all it was held that the British might well be left to their own opinion. France had never expressed an intention of remaining at Fashoda and the only question at issue was on what conditions she should depart. The only danger in the situation lay in the harsh tone adopted by the British. France had nothing to complain of in Marchand's conduct or in the treatment which he had received from General Kitchener. The former's conduct in the affair was regarded with approval by his fellow-countrymen. Marchand had declared that he was at Fashoda merely in obedience to orders; that having reached that place he was attacked by the Mahdists and had repulsed them. When General Kitchener told him that the British regarded Fashoda as belonging to them and that Marchand would be required to evacuate the town, the latter replied that he would not leave until he had received fresh instructions from his government. When the Sirdar pointed out the utter hopelessness of any attempt on the part of Marchand to resist the Anglo-Egyptian force, the latter merely spoke of his duty as a soldier, and of his intention if necessary to die for his flag.

French Discussion of Lord Salisbury's Speech.—A French writer discussing the famous Guildhall speech of Lord Salisbury said that after all it is perhaps not a bad thing for a country to be obliged to beat a retreat in its foreign policy. Such an obligation was, he thought, imposed on France in the unhappy Fashoda affair. It was a trivial incident, and yet trivial incidents sometimes have consequences wholly disproportioned to their importance. It might have been settled more advantageously to France and with a fairer promise of peace in the future. France had no intention of going to war for Fashoda. It was evident says this writer, from the very first conversation between M. Delcassé and Sir Edmund Monson or between M. de Courcel and Lord Salisbury, that France would evacuate Fashoda. She had asked

only such terms as friendly nations substantially in accord have always been ready to grant each other. These terms had been unexpectedly refused and yet even now it did not seem worth while to depart from the friendly attitude that she had hitherto maintained. A comparison was drawn between the conduct of France in this matter and that of Germany when there was a risk of war with Spain over the Caroline islands. At that time Bismarck, who was certainly not lacking in aggressiveness or persistency, had said that Germany must withdraw her claims. The Carolines were not worth a war. To the French the conduct of England seemed incomprehensible unless she actually wished to prolong the strife. The French could not understand why she continued her armament and they were not satisfied with Lord Salisbury's explanation that when the work of armament had once been begun it could not be stopped at once. The spirit of Lord Salisbury's speech was regarded as distinctly warlike. On all sides he seemed to see dangers and a pressing necessity for Great Britain to be constantly on her guard. The French regarded this as almost a threat that Great Britain was about to pursue a policy which would result in war. Nor could they derive much consolation from the remark of the Duke of Devonshire, President of the Privy Council, on the same day at Eastbourne that: "Everybody knew that the Fashoda question was but an incident in a more important question." See GREAT BRITAIN.

In France such remarks were viewed as a warning to Europe. Special alarm was felt over that passage of Lord Salisbury's speech in which he refers to several nations fallen into decadence whose neighbors may some time, moved either by a high philanthropy or by a national desire for creating an empire for themselves contend with each other for the possession of these declining states. It was as if he invited competition in sharing the spoils of weaker nations. What nations were meant, it was asked; could it be Spain or Portugal? It was more likely that he meant China or the Ottoman Empire, or possibly Persia. And the remarks which he made in regard to the concert of Europe were not more reassuring. He had referred to it ironically, dwelling on its infirmities and the impotence which it had at times manifested. Nevertheless it had the merit of maintaining the peace, he said, and in the long run mankind will not readily pardon the man or the nation that shall bring countries to war. In France while it was believed that Lord Salisbury himself was sincerely in favor of peace the feeling of the British people on that point was generally distrusted. It was noted that the British press complained that Lord Salisbury had not gone far enough. It was said that the hatred of war which he had declared to be a characteristic of the English people did not take that practical form which it took some years ago when war was regarded as the last resort for kings and peoples.

French Criticism of the Foreign Policy of France.—The French people could not attach the blame for the unfortunate Fashoda affair to the existing government or to the government that immediately preceded. They placed the responsibility for it rather upon the national policy of the past. It was argued that if France wanted to bring the Egyptian question to a settlement she should have proceeded by way of Cairo instead of Fashoda. Had occupation been planned it was absurd to entrust the work to the inadequate forces of Marchand. Moreover if the government in the past had really hoped to bring the French colony of the Congo and of the Upper Ubangi into communication with the Nile it took a wrong way to realize that aim. It should never have admitted the theory of "dormant rights" or that the Soudan, whatever happened, continued to belong to Egypt and the Porte. If the French government had intended to oppose the interests of England in that part of the world, it should have taken advantage of the proffered alliance of the King of the Belgians on the Congo. France should not have gone to Fashoda alone. It was a profitless policy which the writer of the article above summarized compares to the act of the gardener's dog who protected his master's dinner against others but took nothing of it himself. The failure at Fashoda was the result of these mistakes of past years. France might have allied herself to Italy as well as to the Congo Free State. And the mere elements of political wisdom taught a nation to secure as many allies as possible when confronting a great power. Again, had France adopted this policy early enough Great Britain's ideas in regard to this region would not have attained their present fixity and strength. The French would have gone to the Nile under conditions that guaranteed success. As it was Marchand and his band had displayed great heroism and skill but it was wasted. Such in short was a sample of the comment and criticism in France upon the outcome of the Fashoda dispute.

Anti-Semitism.—On December 23, 1898, the cause of Anti-Semitism encountered a check in the Chamber of Deputies. The government's recall of Mayor Regis of Algiers on the ground of having incited Anti-Semitic disturbances led to an interpellation, and in the discussion of the matter the prominent Anti-Semite, Edouard Drumont, the representative of Algiers, sharply arraigned the government's policy. He declared that France should take warning from the example of Cuba; that

Algeria would become a second Cuba if the government's policy were continued, and like Cuba would be appropriated by a foreign power. He protested against the recall of Regis. Premier Dupuy retorted that Mayor Regis had been the cause of disorder in Algeria and had tried to obtain the recall of the Governor. The Premier attacked the Anti-Semitic movement as the revival of the ignorant and vindictive attitude of past times. The only way to deal with the aggressions of the Jews (for it was admitted that the Jews in Algeria had tried to obtain undue advantages) was by legislation. The Anti-Semitic party, he said, had been singularly barren of legislative measures for redress. Premier Dupuy's speech was loudly applauded and the government received a vote of confidence by a majority of 406 to 10. It was also voted by the Chamber that the speech should be placarded throughout Algeria. See ARCHÆOLOGY and FRENCH LITERATURE.

FRASER, Sir WILLIAM AUGUSTUS, M. A., English writer, died August 18, 1898. He was born in 1826; was educated at Eton and at Christ Church, Oxford; was Member of Parliament for Barnstaple (1852 and 1857), for Ludlow (1863), for Kidderminster (1874-80); he was lord of the baronies of Leanach and Balvraid. Among his publications are: *Words on Wellington, Disraeli and His Day, Coila's Whispers, London Self Governed, Hic et Ubique, Napoleon III.*

FREDERIC, HAROLD, journalist and novelist, died at Henley, England, on October 19, 1898. His death was keenly felt by both readers of the daily press and of current fiction, for he was stricken in the very prime of life. He was born near Utica, New York, August 19, 1856; his family was poor and his systematic education ended with the grammar school when he was fourteen. He obtained work as office boy, draftsman, and retoucher of photographic negatives, and when about twenty drifted into journalism. In 1880 he obtained a position on the editorial staff of the *Utica Observer*, two years later he became editor of the *Albany Evening Journal*, and in 1884, when he was twenty-eight, he went to London as European correspondent of the *New York Times*. From this time to the year of his death he put forth a large amount of work in the spheres both of journalism and of fiction. He did much to elevate the style of newspaper writing and free it from its too frequent crudity and vulgarity, while as a novelist he has shown us new types and conditions of American life in a way which if it does not mark the master, nevertheless reveals the writer of ability and force.

Mr. Frederic's experience before going to London was not very helpful for the development of a successful critic of European politics; but his energy, enthusiasm, and good sense soon gave him that broad and intelligent grasp of political problems which made him not only something of an authority in current history, but a man whose political judgment met with much consideration. Twice he made important excursions for obtaining knowledge first hand. At the beginning of his career as correspondent he made a personal inspection of those districts of southern France and Italy which at that time were infected with cholera; and in 1891, when the Anti-Semitic movement was increasing in Russia, he visited that country, and as a result published in the following year *The New Exodus: A Study of Israel*. Whatever success and whatever excellence Mr. Frederic may have attained as a newspaper writer, he will probably be better remembered as a novelist. His collected works of fiction comprise the following ten volumes: *Seth's Brother's Wife* (1887), *The Lawton Girl* (1890), *In the Valley* (1890), *The Return of the O'Mahoney* (1892), *The Copperhead* (1894), *Marsena, and Other Stories of the War* (1895), *The Damnation of Theron Ware* (1896), *March Hares* (1896), *Gloria Mundi* (1898), and *The Market Place* (1899). Of these books *March Hares* and *The Return of the O'Mahoney* are extravaganzas, exhibiting a kind of exuberant humor and fun that is rarely found in his other stories. His books show careful observation and fine comprehension of life in central New York, where most of his scenes are laid; in fact, although his geographical range was limited, he gave such a new and charming local color to American literature that his books will remain in vogue for years to come. His chief characteristic as a novelist was force and directness of manner, a clear and at times picturesque presentation of what he saw and felt. He used very little ornament and seemed to believe that perspicuity is the chief element of style. *In the Valley* is a stirring and vivid description of events in the Mohawk Valley preceding the Battle of Saratoga in 1777. The rest of his books deal chiefly with life in central New York from the sixties to the eighties, but *The Copperhead* takes the reader to scenes in Indiana. Probably his most popular work, and certainly his greatest one, is *The Damnation of Theron Ware*. Although it is not a pleasing story, is a powerful delineation of the strife between two religious ideals in a man's soul. His novels are not only excellent in themselves, but show promise that Mr. Frederic might have done work that was really of the first rank.

His untimely death aroused much discussion and much unfriendly criticism of the sect known as Christian Scientists (q. v.). For some time he had been suffering

from weakness, overwork, and heart trouble; finally Miss Kate Lyon, a member of Mr. Frederic's household, summoned a Mrs. Mills, a Christian Scientist, who treated Mr. Frederic according to the methods of her sect. The treatment consisted in the rejection of all regular medical assistance and merely in the prayer and "belief" that is practiced by the Scientists. Upon Mr. Frederic's death, Mrs. Mills and Miss Lyon were held by the coroner's jury as criminally responsible, since heart failure, the immediate cause of death, had been accelerated by the absence of medical treatment. Although Mr. Frederic had objected to medicines, there was no evidence that he believed in Christian Science, and it was shown that in his helpless condition he was under the full control of Mrs. Mills. The latter and Miss Lyon, however, were not indicted.

FREE CHURCH OF SCOTLAND, which seceded from the Established Church of Scotland (q. v.), in 1843, consists of a general assembly, 16 synods, 75 presbyteries, 1,165 ministers, 1,094 congregations. In 1898 £666,400 was raised for missions and other expenses. Moderator (1899), Rev. Alex. White, Edinburgh.

FREE MASONS. The reports of the Free Masons in the United States and British America for 1897-98 give 57 grand lodges and 817,227 members, showing a gain of 14,945 members over the preceding year. These lodges are in relation with the English grand lodge, of which the Prince of Wales is grand master, and with those of Germany, Austria, Ireland, Scotland, Peru, Cuba, South Australia, Victoria, New South Wales, and Mexico. The grand lodges and members are as follows: Alabama, 11,368 members; Arizona, 618; Arkansas, 13,663; British Columbia, 1,242; California, 18,808; Canada, 23,398; Colorado, 7,335; Connecticut, 17,053; Delaware, 2,126; District of Columbia, 5,144; Florida, 4,317; Georgia, 18,183; Idaho, 1,175; Illinois, 53,285; Indiana, 29,387; Indian Territory, 3,107; Iowa, 27,489; Kansas, 19,888; Kentucky, 18,464; Louisiana, 5,439; Maine, 22,085; Manitoba, 2,641; Maryland, 7,474; Massachusetts, 38,416; Michigan, 39,576; Minnesota, 15,691; Mississippi, 9,110; Missouri, 30,889; Montana, 2,706; Nebraska, 11,763; Nevada, 832; New Brunswick, 1,781; New Hampshire, 9,111; New Jersey, 16,543; New Mexico, 854; New York, 95,480; North Carolina, 10,370; North Dakota, 2,702; Nova Scotia, 3,409; Ohio, 41,713; Oklahoma, 1,340; Oregon, 4,906; Pennsylvania, 51,031; Prince Edward Island, 520; Quebec, 3,519; Rhode Island, 5,113; South Carolina, 5,853; South Dakota, 4,308; Tennessee, 17,588; Texas, 28,483; Utah, 790; Vermont, 7,758; Virginia, 12,803; Washington, 4,649; West Virginia, 5,983; Wisconsin, 16,946; and Wyoming, 1,011.

FREE SONS OF ISRAEL, INDEPENDENT ORDER OF, a fraternal society founded in 1849, has now 3 grand lodges, 102 subordinate lodges, and 13,000 members. Since 1849 it has disbursed \$6,066,000, and \$225,000 in its last fiscal year. Grand master, Julius Harburger, New York; deputy grand master, Adolph Pike, Chicago; secretary, I. H. Goldsmith, New York; and treasurer, Louis Frankenthaler, New York.

FRENCH CONGO AND GABOON is one of the largest possessions of France in West Africa, having an area of 497,000 square miles and a native population of about 5,000,000. It is bounded on the north and west by the German Cameroon, which it completely shuts off from the interior, and it stretches on the northwest to the southern shore of Lake Tchad. On the north it meets the independent native state of Wadai and the wide tract of country un-annexed by the European powers lying between the Soudan provinces and Egypt on the east and French Sahara on the west. Extensive forests cover its surface, but the soil where cultivated is fertile. The chief products are caoutchouc, coffee, ivory, ebony, redwood, palmetto, palm oil, and gum opal. It is watered by several great rivers, including the Gaboon, the Ogowé, and the Congo, which separates it from the Congo Free State on the southeast. France gained possession of the Gaboon estuary more than fifty years ago, but has only recently extended her authority over the interior. An agreement with Germany in 1894 settled the boundary between the Cameroon and the French territory, and France now has open communications from her Congo possessions to the portion of the Sahara which is within her sphere of influence. In 1897 and 1898 attention was drawn to this part of Africa by the efforts of the French to secure connection with the Nile valley in the east, in accordance with a general plan, it is said, for the extension of French influence entirely across the continent from her Congo possessions to Obock on the gulf of Aden. In the spring of 1897 Major Marchand set out from Brazzaville for Ubangi in the back country of the Congo colony, whence he was to proceed to the district of Bahr-el-Ghazal and the White Nile. The successful issue of this adventure brought Major Marchand to Fashoda, where his party hoped to join a party coming from Obock under M. Bonchamps by way of Abyssinia. Major Marchand's stay at Fashoda brought about the international complication between France and England which for the moment threatened to bring the countries to war. (See the article on EGYPT.) A recent writer on the French possessions of the Congo emphasizes the good work that the French have accom-

plished in that region in putting down the slave trade and the cruelties practiced by the trading Arabs. And this he says has been accomplished with the aid of a very small force of Senegalian troops, since the results have mainly been secured by peaceful means. The inhabitants of the coast region seem to be in a state of savagery and given to the practice of cannibalism, but not difficult to manage if principles of justice are strictly maintained. Toward the interior the people are in an even ruder stage, but along the Shari and the Ubangi rivers where Mussulman influence predominates, the condition of the natives improves. The French have tried to maintain friendly relations with the sultans, Rafai and Zemio, and it was by the aid of the latter that Marchand reached the Bahr-el-Ghazal, and descended one of its streams toward the Nile. The determination of the French to establish communication with the Nile assumed that the Egyptian government had been driven out of the Soudan by force and that therefore the abandoned provinces belonged to any nation that had the good luck to be the first to seize them. On the other hand England declared that Egyptian rights though dormant, were still existent over the Soudan, the whole of which was at one time undoubtedly administered by her. Since Egypt had evacuated the Soudan at the advice of Great Britain the latter power declared that she held herself in honor bound to return it. Gordon, himself, had actually visited Bahr-el-Ghazal, which, from its importance as a recruiting ground, was regarded as indispensable to the control of the Soudan.

FRENCH GUIANA, a colony of France lying to the east of Dutch Guiana, on the northeast coast of South America, has an estimated population of 22,714, and an area of about 46,850 square miles. The boundary lines, however, between it and Dutch Guiana and Brazil have not been definitely established. The capital is Cayenne, situated on a small island of the same name off the coast, and having 12,351 inhabitants. The administration of the colony is vested in a governor, council-general, and municipal councils, and there is a representative, or deputy, in Paris. The country is poorly cultivated and its trade unimportant. Gold is found and in 1896 101,938 oz. were exported; 58 per cent. of this came from the territory claimed by Brazil and the disposition of which was given over to a board of arbitration. April 1897. The local budget for 1897 was 2,770,000 francs; and the expenditure of France (the budget for 1898) was 6,161,000 francs. Of this latter amount 4,732,000 francs were for the French penal establishment; for French long-term prisoners are sent to either New Caledonia or French Guiana. The population of the penitentiaries together with the liberated convicts, amounts to about 4,500. Besides Cayenne, there are a few other small islands off the coast belonging to the colony, one of which is the Ile du Diable, where Captain Alfred Dreyfus was imprisoned after his conviction.

FRENCH GUINEA comprises the region on the northwestern coast of Africa, between Portuguese Guinea and the British colony of Sierra Leone, having a population of about 47,500; but it is united for administrative purposes with the Ivory Coast and Dahomey, including under the former designation the French settlements of the old Gold Coast, namely Grand Bassam, Assinie, Jackeville, and Grand Lahou; and under the latter the colony of Dahomey, comprising the districts of Porto Novo, Kotonu, Grand Popo, and Agoué, the rest of Dahomey being a French protectorate under the immediate government of a native king. On January 1, 1890, the colony of French Guinea was detached from Senegal and placed under a separate administration, the seat of government being Konakry, the capital of French Guinea proper. The products of the entire region include India rubber, palm oil, sesame, and gum. Each of the three districts has a governor and enjoys autonomy in local affairs, but in political and military affairs is subject to the Governor-General of French West Africa. An agreement between France and Liberia settled the boundary line on that side in 1891, and the Sierra Leone frontier was determined between England and France in 1895. The upper course of the Niger was guaranteed to France and the continuity of French territory in the hinterland of French Guinea was assured. The area of the French settlements on the Ivory Coast (including a portion of what was formerly known as the Gold Coast), together with those on the coast of Dahomey, is about 25,000 square miles. See DAHOMEY and NIGER TERRITORIES.

FRENCH LITERATURE. It is difficult to characterize the present trend of French literature, which seems to be distinctly in a transition state. Ferdinand Brunetière, the valiant champion of tradition, finds evidence in the publications of the past year,—and not only in such works as Victor Charbonnel's *Congres des Religions*, and Pierre Laffitte's *Le Catholicisme*, but also in dramas like Jules Lamaitre's *L'Ainée*, or *Les Mauvais Bergers* of Octave Mirbeau,—that more attention than ever is being paid to religious questions. On the other hand, a new critic, Charles Recolin, whose recent volume, *L'Anarchie Littéraire*, has attracted considerable notice, boldly asserts that the condition of the literature of the day is nothing less than anarchistic. As usual, the truth lies somewhere midway between the two extremes; but all that can be safely affirmed is that individualism seems to be still on the increase.

History.—Few of the leading historians are represented in the list for 1898. Albert Sorel, le Comte Vandal, Henry Houssaye and G. Hanotaux have published nothing beyond fragments of future works. We have, however, the Duc de Broglie's *L'Alliance Autrichienne*, at the period of the Seven Years' War, and *L'Alliance Savoyarde et la Duchesse de Bourgogne*, by the Comte d'Haussonville, which stands upon the dividing line between history and biography. Among general works should be mentioned M. Renouvier's *Philosophie Analytique de l'Histoire*, in four large volumes. Another important work is *Entretiens sur l'Evolution Historique*, by André Lefèvre, professor in the Ecole d'Anthropologie, at Paris. The author defines history as "an indefinite tissue of adventures determined by the expansion, the meetings and the passions of human groups," and predicts that a time will come when humanity will control the course of history. Of volumes relating to particular epochs of French history there are quite a number. Two deal with Louis XIV: *Les Grands Traits du Règne de Louis XIV*, by Dr. Henri Vast, and the first part of *La Politique Etrangère de Louis XIV*, by Edouard Waldteufel, who holds that, far from being the aggressor in his various foreign wars, the French king acted only on the defensive. The period of the French Revolution is treated in the following works: *Les Sections de Paris pendant la Révolution Française*, by Ernest Mellié; *Le 13 Vendémiaire An IV*, by Henry Zivy, and the fifth volume of Edmond Biré's excellent *Journal d'un Bourgeois de Paris pendant la Terreur*. *L'Armée de Bonaparte en Egypte*, by the Commandant Guitry, and the first part of the Commandant Margueron's *Campagne de Russie*, are two works which throw interesting light upon the Napoleonic campaign. The third volume of Emile Ollivier's *L'Empire Liberal* studies the foreign policy of Napoleon III, down to the war with Italy. Three works dealing with the Franco-Prussian War must be mentioned: *Paris: Le Bombardement et Buzenval*, by Alfred Duquet, to whom the Academy awarded the prix Berger; *Siège de Paris; Chatillon, Chevilly, la Malmaison*, by Pierre Lehautcour, who has already consecrated five volumes to the campaigns of the Loire, the East and the North; and a curious little volume of Souvenirs of a telegraph operator, M. J. Bitteau, entitled *Strasbourg: L'Armée de la Loire: l'Armée de l'Est*.

Other noteworthy publications are the first part of Charles de la Roncière's *Histoire de la Marine Française*, and the second volume of Godefroy Cavaignac's important work on *La Formation de la Prusse Contemporaine*, which covers the period 1808-1813. M. Gustave Saige, who at present has charge of the archives of the palace at Monaco, is the author of a history of that curious little state, based upon original documents.

Biography.—There is as usual no dearth of Napoleonic literature, and the list is headed by two volumes of *Lettres Inédits*, published by M. Lecestre, and consisting of certain letters which reflected little credit upon Napoleon's character and which were accordingly omitted by the editors of the *Correspondance*. A truer picture of the Emperor is obtained from Arthur Chuquet's two volumes on *La Jeunesse de Napoléon*, and two on *Napoléon et sa Famille*, by Frederic Masson, which are full of unedited documents. The latter author also published in December a masterly study of *Josephine Imperatrice et Reine*. Two interesting volumes of reminiscences are *Souvenirs et Anecdotes de l'Ile d'Elbe*, by Pons de l'Herault, director of the mines at Elba during Napoleon's sojourn; and a new edition of Dr. Antommarchi's *Derniers Momens de Napoléon*, which appeared originally in 1823 and is now for the first time republished with commentary by Désiré Lacroix. In addition to the volume by the Comte d'Haussonville, already mentioned, there are several biographies, whose chief interest is historical. Such are *Marie de Medicis*, by Berthold Zeller, forming the third volume of his history of Louis XIII; *Maryzienka, Reine de Pologne*, by K. Waliszewski, which has all the charm of an historical novel; *La Carrière du Maréchal Suchet*, by François Rousseau, and *Voltaire avant et pendant la Guerre de Sept Ans*, by the Duc de Broglie. To the same category may be added *Mémoires du Sergent Bourgogne (1812-1813)*, by Paul Cottin, and *Le Duc de Richelieu*, by Raoul de Cisterne. M. Léon Laforge completed the first volume of his *History Complète de Mac-Mahon, Maréchal de France*. Two new volumes in an admirable little series inaugurated by *Guillaume II Intime*, are *Bismarck Intime*, by Jules Hoche, and *Félix Faure Intime*, by Paul Bluysen, all of which have been regarded as works of exceptional interest. *Verlaine Intime*, by Charles Donos, which contains one of the most curious chapters in the history of contemporary letters, forms a convenient transition to biographies of men of letters; and in these the past year has been fertile. First of all should be mentioned two interesting collections of letters: *Correspondance entre E. Renan et M. Berthelot*, the fruit of life-long friendship, which almost does duty as a "Renan Intime" and the *Correspondance de Victor Hugo*, containing, among others, interesting letters to Lamartine and Baudelaire, to François Coppée and to George Sand. The last named writer is the subject of a delightful little biography, *Autour de Nohant*, by Edmond Planchut, who has here chosen to portray her rather as the "good lady of Nohant" than as the author of *Valentine* and *Indiana*.

A touching tribute to the memory of Alphonse Daudet is contained in the memoir written by his son, Léon, who has here given utterance to "those cries with which heredity and the love of his father had filled his respectful soul." The volume has been pronounced Léon Daudet's best effort. Still another Daudet, Ernest, has published a life of the Duc d'Aumale, which may be grouped here, since the latter was no less a master of the pen than a brilliant general. New volumes in the *Grands Ecrivains Français Series* are *Marivaux*, by Gaston Deschamps; *Racine*, by Gustave Larroumet; *Merimée*, by Augustin Filon, and *Corneille*, by Gustave Lanson. The last-named volumes partake quite as much of the nature of criticism as of biography; and the same may be said of *Lamartine, Poète Lyrique*, by Ernest Zyromski; and *Essai sur Chateaubriand*, by André Maurel.

Criticism.—M. Brunetière holds such a commanding position among French critics that it is only natural to give the first place to his admirable *Manuel de l'Histoire de la Littérature Française*, which appeared at the close of 1897. In his contention that André Chenier is the last of the classics, M. Brunetière finds supporters in Louis Bertrand, who has written *La Fin du Classicisme dans les Dernières Années du XVIIIe Siècle*, and Henri Potez, author of *L'Elégie en France depuis Parny jusqu'à Lamartine*. An important contribution to literary history is Prof. Paul Lacombe's *Introduction à l'Histoire Littéraire*, in which the author propounds such fundamental questions as: What is literature? What is style? and answers them in his own way, producing a conscientious, learned and altogether novel volume. Joseph Texte, the author of *Jean-Jacques Rousseau*, has again affirmed the importance of the comparative study of literature in a new volume, *Etudes de Littérature Européenne*; and Eugène-Melchior de Vogüé has gathered together, under the title *Histoire et Poésie*, a number of cosmopolitan studies, ranging from Robinson Crusoe to Gabriele d'Annunzio. Jules Lemaitre is represented in criticism this year by the tenth volume of his *Impressions de Théâtre*. Emile Faguet has been more industrious, having published not only *Drame Ancien, Drame Moderne*, containing interesting parallels between the Greek, French and English theatre, but also a second series of *Politiques et Moralistes du Dix-neuvième Siècle*, containing seven studies ranging from Saint-Simon to Auguste Comte. Edouard Rod also has two volumes of criticism: An admirable *Essai sur Goethe* and a second collection of *Etudes sur le XIXième Siècle*. Other noteworthy volumes are: *Etudes de Littérature Contemporaine*, by Georges Pellissier; *Pointes Séchées*, by Adolphe Brisson; a second series of *Etudes sur la Littérature Française*, by René Doumic; and *Le IIe Livre des Marques*, by Rémy de Gourmont, containing brief but admirable characterizations of a score or more of writers of the younger school, who represent certain extreme forms of their art. A capital book on the modern Italian poets is *La Poésie Italienne Contemporaine*, by Jean Dornis; and two excellent volumes on English literature are *Walter Scott et son Influence sur le Mouvement Romantique*, by Louis Maigron, and *Shakespeare en France sous l'Ancien Régime*, by J. J. Jusserand. A book which does not lend itself readily to classification is Mme. Arvède Barine's *Névrosés*, which contains valuable studies on Hoffmann, de Quincey, Edgar Allan Poe, and Gérard de Nerval.

Fiction.—A striking feature in recent French fiction is the growing tendency to write novels in trilogies. The most notable volume of this class for 1898 is undoubtedly Zola's *Paris*, the last of his series of *Les Trois Villes*, notwithstanding the fact that it appeared at an unfortunate time. It follows the career of the young priest, Pierre Froment, down to the severance of his connection with the Church; and incidentally charity is weighed in the balance and found wanting, as was faith in *Lourdes* and hope in *Rome*. Another trilogy has been begun by the brothers Paul and Victor Margueritte, who have for the past few years collaborated. The first volume, *Le Désastre*, deals with the capitulation of Metz in 1870, and naturally challenges comparison with Zola's *La Débâcle*, but as M. Brunetière has said, differs from it in "touching a still bleeding wound with pious hands." After a silence of several years, Maurice Barrès reappears with a new book, *Les Déracinés*, which marks an epoch in his career. This volume, which is also one of a series of three, belongs to the class of sociological novels, and was written as a protest against the present tendency on the part of young men to flock to Paris from the provinces. The second volume, *L'Appel au Soldat*, was completed during 1898, but for political reasons its publication has been indefinitely postponed: the third and last volume, *L'Appel au Juge*, lies altogether in the future. Still another cycle of novels, dealing with the Napoleonic epoch, has been projected by Paul Adam, of which the first volume, *La Force*, has just appeared. The same author published earlier in the year a strange collection of short tales, *Les Tentatives Passionnées*. One of the most delightful novels of the year is *Le Mannequin d'Osier*, of Anatole France, which follows his *Orme du Mail*, of the previous year. With a minimum of plot and action he has succeeded in giving a most convincing picture of contemporary life, enlivened by that particular form of indulgent irony for which M. France is renowned. Another volume of almost equal importance is Edouard Rod's *Le Ménage du Pasteur Naudé*,

in which the poor pastor learns by bitter experience that he cannot serve two masters; that he cannot serve God on the one hand, and Mammon on the other, in the shape of a young and capricious wife. Paul Bourget is represented by two volumes: three novellettes, united under the title of *Complications Sentimentales*, and one long novel, *La Duchesse Bleue*. The name originally chosen for the latter romance was "Three Artists' Souls," the three souls in question being those of a novelist, an actress and a painter; and their mutual relations are developed with that pitiless clairvoyance for which M. Bourget is renowned. Other novels, which, for want of space can merely be mentioned by name are, *Soutien de Famille*, the last novel by Alphonse Daudet, and generally acknowledged to be disappointing; *Jacquine Vanesse*, in Victor Cherbuliez's familiar manner; three volumes by André Theuriet, *Le Refuge*, *Lys Sauvage* and *Dans les Roses*; *La Cathédrale*, by J. K. Huysmans, who here continues the history of a religious evolution, begun in *La-Bas* and in *En Route*. *Gens de Poudre* is the name of Hugues Le Roux's latest book, the first of a series of novels of adventure, which he has undertaken to write on the conquest of Algeria. Among the works of comparatively new writers must be mentioned *Les Façades*, by François de Nion; *Saint Cendre*, by Maurice Maindron; *La Confession d'un Enfant du Siècle*, by Michael Corday; *Temple d'Amour*, by Rémy Saint Maurice; and *Lèvres Closes*, by Daniel Lesueur. The indefatigable "Gyp" has to her credit *Israel*, *Sportomanie*, and *Miquette*; and Georges Ohnet gives us his periodic volume in the shape of *Le Roi de Paris*.

Poetry.—Notwithstanding the large number of contemporary French poets, many of whom have attained distinction, few if any of the volumes of verse which have appeared during the past eighteen months, belong to the highest order of poetry. M. Le Vte. de Guerne, in his *Bois Sacré* still draws his inspiration from Leconte de Lisle's *Poèmes Antiques*, although he here gives evidence of more ease and liberty than in his earlier *Les Siècles Morts*. To the same order of poetry belongs *Jeux Rustiques et Divins*, by Henri de Régnier, who is one of the leaders of the younger school, and a poet of undoubted talent. Another young poet of whom much may be expected is Albert Samain, whose latest volume, *Au Jardin de l'Enfante*, contains some exquisitely musical verse. Philippe Dufour has written a volume of *Poèmes Légendaires*, to which M. de Hérédia furnishes the introduction, and which celebrate the sadness of love and the glories of patriotism. Anatole Le Braz is a writer justly admired, both for his prose and his verse, and the poems which he has united under the title of *La Chanson de Bretagne* have been declared by more than one French critic to embody the very soul of Brittany. Other collections of poems which deserve at least a passing notice are: *La Clarté de Vie*, by Francis Vielé-Griffin; *Poèmes Fabuleux*, by Heri Ronger; *Le Cœur Solitaire*, by Charles Guerin; *Poèmes de l'Amour et de la Mort*, by André Lebey, the author of *Chansons Grises*; *Sources vers le Fleuve*, by Robert de Souza, who has already attracted some attention by his *Fumerolles*; and a little posthumous volume of poems by Paul Guigou, entitled *Interrupta*.

Drama.—Many verse dramas have appeared during the past two seasons, including, besides M. Rostand's famous *Cyrano de Bergerac* (see ROSTAND), the *Frédégonde* of M. Dubout, and the *Martyre*, of Jean Richepin, both of which may be classified as pseudo-classic tragedy. The former of these is drawn from the *Récits Mérovingiens* of Augustin Thierry; the latter has been described by M. Brunetière as "a nondescript confusion of the essence of Christianity with the profanest element in the passions of love." For many reasons one of the most interesting dramatic productions of the year is *Struensee*, by Paul Meurice, one of the last surviving champions of romanticism. At the age of eighty he has produced a tragedy which for the virility of thought and beauty of its verse may well be the envy of younger men. The hero is a little Dutch physician, who has been nurtured on the tenets of Voltaire and Rousseau, and whom chance has introduced into the court of Christian VII, of Sweden, where his efforts to inculcate Rousseau's doctrines of equality eventually cost him his head. In addition to *La Reine Fiamette*, Catule Mendés has written a tragedy, *Médée*, based on the familiar classic story and much praised for the beauty of its verse. An event more interesting from a literary than a dramatic standpoint, was the production of Pierre Loti's *Judith Renaudin*, a play written in the exquisite form which we have a right to expect from the author of *Mme. Chrysanthème*, but marred by the improbability of the plot. The action takes place in the little island of Oléron, just after the revocation of the Edict of Nantes. The family of Renaudin figures prominently among the stanchest of French Huguenots and d'Estelan, the captain of dragoons, sent to compel their conversion to Catholicism, is, instead, himself converted to Protestantism by Renaudin's daughter Judith, with a promptness no less startling than the speed with which they both fall in love with each other and decide to take refuge together in Holland. The play is a good instance of what the French characterize as a *succès d'estime*. Among the plays which have met with a more hearty reception both from the public and the critics must be mentioned the *Repas du*

Lion, by François de Curel, which treats of the relation between capital and labor; *Les Mauvais Bergers*, of Octave Mirbeau, which is a dramatized history of a strike; Jules Lemaitre's charming comedy, *L'Ainée*, which deals with some of the difficulties which confront a Protestant pastor in his attempts to procure suitable husbands for a numerous family of daughters; the *Vassale*, of Jules Case, which treats of the marriage question; and *Le Berceau*, by M. Brioux, which shows some of the complications which may arise when a divorced couple meet again, by the bedside of their sick child, after the wife has remarried. *Le Calice*, by F. Vandérem, is a play of considerable force, being a psychological study of a wife who has known for years that her husband has been systematically deceiving her, and who has had the courage to conceal her knowledge. *Georgette Lemonnier* is the latest play by Maurice Donney, the author of *La Douleur*. Lastly, an event of no small interest to the dramatic world of Paris, was the election to the French Academy of Henry Lavedan, whose typically Parisian *Nouveau Jeu* had sufficed to make him famous.

FRENCH SCHOOL AT ATHENS. See ARCHÆOLOGY (paragraph Greece).

FRENCH SOUDAN includes the basins of the Upper Senegal and the Upper Niger and the region extending inland from French Guinea and from Senegal. Part of this region has been annexed and part is under protectorates. The annexed portion, chiefly on the Upper Senegal, has an area of about 54,000 square miles and a population of 360,000, and the protectorates have an estimated area of 300,000 square miles and a population of 2,500,000. This thickly populated and well-watered region promises to be the seat of an important commerce, but to the north and east it merges in the desert land of the Sahara, which is estimated to comprise some 1,500,000 square miles. A railway which was originally designed to connect Kayes on the Senegal with the Niger has been partly completed, and lately a line has been proposed from Konakry on the coast of French Guinea to the Niger. The government is carried on by a superior military commandant under the general authority of the government of Senegal. A small force of native troops is maintained.

Timbuctoo on the edge of the desert was found upon its acquisition by the French to fall far short of the expectations of wealth which had been formed of it from the early reports, but it is said that the trade has lately improved. The savage Tuaregs have been the principal obstacle to the extension of French influence over the Sahara. French activity in this portion of West Africa has had important results. In 1898 France held the most prominent place among the powers in this portion of the continent. Treaties with Liberia and Sierra Leone have fixed the French boundaries with those districts and hemmed them into the sea and the same is true of the Gold Coast and German Togoland, so that the entire region lying behind those colonies and including the upper and middle course of the Niger is held by France. At the beginning of the year 1898, however, the northern boundary of French Dahomey and the English Lagos was not fixed, and a commission was in session at Paris to settle it. From the French point of view it was important to have the town of Bussa on the Niger, for above that point the rapids make navigation difficult. It was said that the retention of this point was essential to France in order that the French Niger region might have communication with the sea. It was further urged that France had occupied that region legally by treaties with the native chiefs. For the final award of the commission on the subject see the article NIGER TERRITORIES.

FRIENDS OF THE FLORIDA SEMINOLES is the name of a recently organized society which has for its aim the improvement of the Florida Seminoles, and opposes their deportation from the State without their consent. It seeks to promote their civilization, to secure lands for their permanent homes, to establish industrial schools, and to assist them to prepare for the change that must soon come from the rapid settlement of the southern portion of the peninsula. The society will be non-partisan and non-sectarian, asking the hearty support of all lovers of humanity for a helping hand to their red brother. There will be no fees nor assessments, but voluntary contributions only. The society hopes to secure strong support throughout the State.

FRIENDS, SOCIETY OF, better known as Quakers, consists of four bodies: Orthodox, Hicksite, Wilburite, and Primitive. As to the progress made by the denomination during the year it was reported that while not many new churches were added, those already existing had increased in influence and in the number of their members, and that this growth has been especially marked in the country districts. The most interesting event of 1898 was the acquisition of a new college in Wichita, Kansas, originally the Garfield university, owned by the Disciples of Christ. It was the gift of James M. Davis of St. Louis, and was opened in the autumn as the Friends' University. The number of Friends volunteering in the Spanish-American War was very small, a matter of pride with the sect. A church edifice was acquired in Washington and they sent missionaries to Alaska and to the American Indians, as well as to foreign lands.

The American Friends joined with the English Friends in aiding the persecuted Russian Doukhobortsi (q. v.) to emigrate to the Caucasus, free from persecution. The New England Friends established a large training school for girls near Jerusalem. The Hicksites held a large conference in Richmond, Ind., when much future work was mapped out. The reports for 1898 are: Orthodox Friends, 830 churches, 1,272 ministers, and 92,073 members; the Hicksite Friends, 201 churches, 115 ministers, and 21,992 members; the Wilburite Friends, 53 churches, 38 ministers, and 4,329 members; and the Primitive Friends, 9 churches, 11 ministers, and 232 members; the total being, 1,093 churches, 1,436 ministers, and 118,626 members. According to the latest report of the commissioner of education, issued January 1, 1899, the Friends have 7 colleges in the United States, with 81 officers of instruction, 768 students and endowment funds of \$1,139,000.

Friends of the Temple, with 4 churches, 4 ministers, and 340 members, are a different body.

The Society of Friends in England consists of 16,854 members and there are 2,592 in Ireland. They have altogether in the United Kingdom 375 recorded ministers, including 149 women, and 403 meeting places.

FROST, PERCIVAL, Sc. D., F. R. S., was born at Hull, England, September 1, 1817; died June 5, 1898. He was educated at St. John's College, Cambridge; was lecturer on mathematics at Jesus College, 1847-59, and at King's College, 1860-90. He was a fellow of the last named college and formerly of St. John's. Among his published writings are: *Solid Geometry*; *Solutions of Problems in Solid Geometry*; *Treatises on the First Three Sections of Newton's Principia*; *Curve Tracing*, etc.

FRYE, WILLIAM PIERCE, Republican United States Senator from Maine, was appointed by President McKinley, August 26, 1898, one of the five commissioners to negotiate a treaty of peace with Spain. He was born at Lewiston, Maine, September 2, 1831; was graduated at Bowdoin College, 1850; was admitted to the bar; member of Maine legislature 1861, 1862, and 1867; presidential elector in 1864; mayor of Lewiston, 1866-67; Attorney-General of the State, 1867-69; member of the national Republican executive committee, 1872, 1876, and 1880, and was a delegate to the national Republican conventions of these years. In 1880 he was elected a trustee of Bowdoin; in 1881 received the degree LL. D. from Bates College, and in 1889 from Bowdoin. Upon the resignation of James G. Blaine from the Federal Senate to become Secretary of State, he was elected to fill the vacancy and took his seat March 18, 1881. In November of that year he succeeded Mr. Blaine, resigned, as chairman of the Maine Republican State committee. He was re-elected to the Senate in 1883, 1888, and 1895; in the last named year his election was unanimous with the exception of one vote. On Feb. 7, 1896, he was elected president *pro tempore* of the Senate.

FUEL GAS. See GAS.

FULLER'S EARTH. The chief use of this material at the present day is for clarifying oils, and to a lesser degree for removing the grease from cloth and fur. In 1897 the production amounted to 17,113 short tons, supplied mostly by the deposits at Quincy, Florida, and in small amounts by Colorado and New York. The material obtained in the latter State works well for fulling cloth, but not for clarifying oils. New deposits of excellent quality are reported from Ocala, Fla., and Valentine, Neb., but the extensive beds of fuller's earth in the Black Hills still remain in a comparatively undeveloped condition.

FUNGI. See BOTANY.

FURNACE. See GARBAGE and IRON AND STEEL.

GAGE, LYMAN J., Secretary of the Treasury under President McKinley, is of English descent and was born at De Ruyter, Madison county, N. Y., June 28, 1836. His parents having moved to Rome, Oneida county, when he was ten years old, he attended the Rome Academy for four years, and this was practically all the scholastic education which he received. Having acted as office boy in the Oneida Central Bank for two years, he went at the age of nineteen to Chicago where he found work in a lumber-yard and planing mill. Here he acted both as bookkeeper and as a common laborer about the yard. When serving as night watchman for this company Mr. Gage was offered a position as a bookkeeper for the Merchants' Savings, Loan, and Trust Company at a salary of \$500 a year. His rise was rapid for he was soon made paying teller, assistant-cashier, 1860, and cashier a year later. He left this position in 1868 to accept a similar one in the First National Bank. When this bank was re-organized in 1882 with a capital stock of \$3,000,000 Mr. Gage was made vice-president, and upon the retirement of S. M. Nickerson, he became president on July 1, 1891.

Mr. Gage has been a very prominent man in public affairs and in matters of finance. As chairman of the committee which was to select a site for the World's

Columbian Exposition, he worked faithfully for the choice of Chicago. It is said that much of the success of the Exposition was due to Mr. Gage; he was the first president of the Exposition Company and was president of the Bankers Section of the World's Congress. The following have been given as some of the more prominent positions that have been held by him: "Member of the clearing house committee when the Chicago Clearing House Association was first organized; an officer of the Chicago Citizens' League upon its organization in 1885; director of the Union Stockyards National Bank upon its organization in 1869; member of the executive committee of the Commercial Club of Chicago at its founding in 1885; vice-president of the Union Club in 1884; treasurer of the Young Men's Christian Association in 1878 and 1879; treasurer of the Chicago Art Institute for many years; chairman of the committee on finance for the Republican national convention of 1880; president of the Civic Federation of Chicago." See CURRENCY REFORM and UNITED STATES.

GALVIN, OWEN A., ex-United States District Attorney, died in Boston, Massachusetts, December 18, 1897. He was born in that city in 1852; having been graduated at the Boston University Law School, he was admitted to the bar in 1876, and in 1881 was elected to the State legislature. At one time he was Democratic candidate for mayor of Boston, and from 1887 to 1890 United States District Attorney.

GAMBIA, one of the West African colonies of Great Britain, is situated on the western coast of Africa at the mouth of the river Gambia, the area of the settlement proper being 69 square miles and the population in 1894, 14,978, but the total area of the country within its sphere of influence is placed at 2,700 square miles with a population of 50,000. The white population is very small, but missionary work has resulted in converting a great many of the natives to Christianity. In 1894 the population of the settlement proper included 2,385 Christians and 5,300 Mohammedans. The exports are chiefly ground nuts, hides, beeswax, rice, cotton, corn and India rubber. Unlike the other West African colonies of Great Britain its revenue has not increased since 1892 and its exports and imports have fallen off since that date, but the total tonnage of vessels entered and cleared at its ports has slightly increased in the last five years. Its chief town is Bathurst on the island of St. Mary, with a population of 6,000. The colony is important because it commands the Gambia river, which is navigable by ocean steamers. It is a crown colony governed by an administrator (R. B. Llewelyn in 1898) who is assisted by an executive and legislative council. It was first discovered by the Portuguese and was founded by the British toward the close of the 17th century. Till 1888 it formed a part of the West African Settlements, but in December of that year became an independent colony.

GARCIA Y INIGUEZ, General CALIXTO, prominent Cuban military leader, died of pneumonia at the Hotel Raleigh, Washington, D. C., December 11, 1898. At the time of his death he was at the head of a Cuban commission which after the close of the war had come to Washington to negotiate with the Federal authorities certain questions of diplomatic and financial importance. General Garcia was born at Holguin, province of Santiago, Cuba, on an October 14, but the year is disputed, being variously stated as 1836, 1838, and 1840. His family was one of excellent repute and considerable prominence, and after receiving a good education he was trained for the profession of law. Throughout his varied career he maintained an interest in intellectual and literary pursuits. His long career as a Cuban patriot began with the rebellion which broke out in 1868, known as the Ten Years' War. On October 13, of this year, three days after the Yara proclamation, Garcia with Donato del Marmol as associate leader, at the head of 150 men began the revolutionary movement in Santa Rita, Jaguani, and Baire. His action was quick and decisive and he drove the Spaniards out of town after town, including Holguin, and participated in many of the small but hard fought battles and skirmishes of that time, including the engagements of Cupeijal, Biguano, Santa Maria, and Zarzal. He rose rapidly to the rank of major-general, assuming for a time the chief command when the Provisional Government removed General Maximo Gomez. In the sixth year of the insurrection, 1873, some of the Cuban bands came to grief. Detached from his forces, General Garcia on September 3, with only twenty men was surrounded by five hundred Spaniards and though he shot himself through the mouth and head to avoid capture alive, he revived and having been transported to Spain was imprisoned in Valencia and Santona. When the peace of Zanjón was signed in 1877 General Garcia at the request of Captain-General Campos was released by Premier Canovas and he came to New York. In 1880 upon the outbreak of the six months' insurrection—"the little war"—General Garcia returned to Cuba where he fought side by side with Antonio Maceo. At Bayamo Garcia's force was compelled to surrender; again at the order of General Blanco the Spaniards showed clemency by sparing the life of the rebel chief, who was sent to Madrid where he lived for about fifteen years under police surveillance. During this time he taught young Spaniards the French and English languages.

Upon the outbreak of the last insurrection the old leader grew impatient, and

one night eluded the police and soon succeeded in reaching Paris, from which he sailed for New York on *La Champagne* in November 1895. During the following months he became famous as a filibuster. Late in 1895, with the assistance of the Cuban junta and probably aided by some rich Americans, he organized the relief expedition which came to grief with the wreck of the old and unseaworthy *J. W. Hawkins* not far from New York harbor, January 1896. Most of the men on board, including General Garcia, his son, and 120 other Cubans were rescued, but arms and ammunition costing \$200,000 were lost. General Garcia began to fit out another expedition, but was intercepted by the United States government, which arrested him on charge of violating the neutrality laws, and held him pending his trial in \$2,000 bail, which he furnished. Before the trial came, however, he succeeded in reaching Cuba on the steamer *Bermuda*. He landed with 62 Cubans at Mariel, Pinar del Rio, in March, 1896, bringing a store of weapons, provisions and money. The next month, as Commander of the Department of the East, General Garcia defeated a Spanish force under General Munez near Zarija, inflicting a loss of more than 200 killed and 400 wounded, while the Cuban loss was slight. The following June, however, Garcia was defeated twice by General Gasco, once near Venta de Cassanova and once near Bayamo, Santiago province. But in the fall he won a great victory in the capture of Guimaro with its forts; here he captured 300 Spanish officers and men, and besides a quantity of Mauser rifles, machetes, clothing, gold coin, and 200,000 rounds of ammunition. Toward the close of this year (1896) he made an attack covering many miles and lasting several days upon a Spanish convoy under command of General del Rey and bound from Manzanillo to Bayamo. The fighting was severe, and though the column succeeded in reaching its destination, it was only at a terrible loss. An event which greatly increased the prestige of the insurgents was the capture of the city of Holguin (pop. 34,700) by General Garcia in the spring of 1897. From this time on Garcia held the interior of Santiago province until the time of the Spanish-American War. In January, 1898, an important engagement occurred in which Garcia ambushed near Caiman a Spanish force under Generals Linares and Luque; the Spaniards were caught in a ravine and, it was said, more than 150 were killed.

When the American forces came to Santiago, General Garcia tendered the services of his 4,000 Cubans. The question of the efficiency of these men has been much discussed. They took part in the battle of El Caney before Santiago, July 1, 1898, and were instrumental in making it impossible for the Spanish General, Pando, to effect a union with the Spaniards in Santiago. Upon the fall of Santiago some friction arose between General Garcia and General Shafter since the latter refused to allow the Cuban leader to be present at the surrender of General Linares in any but a private capacity. Garcia thereupon withdrew his forces to a point a few miles distant, but on September 23, he decided to return to Santiago, where he was received with enthusiasm. He entertained grateful feelings toward the United States and did much to reconcile the Cubans to the temporary American occupation. Garcia, Maximo Gomez, and Antonio Maceo will probably be remembered as the three Cubans who did most for the liberation of the island. Maceo was ambushed and killed by the Spaniards—perhaps at the connivance of his surgeon-general, Dr. Maximo Zertucha—on December 4, 1898; General Gomez still lives.

General Garcia's death—occurring after Cuba was nominally liberated, but before the first fruits of the victory were realized in the Spanish evacuation of Havana, January 1, 1899,—produced profound regret and sorrow in both Cuba and America. At the funeral in Washington a detachment from Battery E, 6th U. S. Cavalry, acted as body guard by direction of Major-General Miles, and the honorary pall-bearers were Secretary Hay, Senators Proctor and Thurston, and Generals Miles, Wheeler, Lawton, Shafter, and Ludlow. The body was taken to the national cemetery at Arlington and thence transferred to Cuba by the United States despatch boat *Dolphin*, detailed for the purpose by Secretary of the Navy Long. General Garcia was a devout Catholic. He left a wife, two daughters, and two sons, one of the latter being a member of his father's staff in Cuba.

GARBAGE AND REFUSE COLLECTION AND DISPOSAL. New York, Boston and some other cities are now compelling householders and others to separate those wastes which are removed by vehicles (in contradistinction to sewage, which flows away in pipes) into three classes: (1) Garbage, or the organic wastes of the kitchen; (2) ashes; (3) a miscellaneous assortment of paper, rags, twine, excelsior, shavings, wood, rubber and leather goods, and perhaps bottles, tin cans and similar articles. The object of this separation is to facilitate final disposal and the sale of material of value. In 1898 Boston established, through a contractor, a garbage reduction plant, at which grease, ammonia and a fertilizer base are recovered from the garbage for sale. The plant was built by the New England Sanitary Product Co., under a ten-year contract which provides that the company shall receive the garbage brought to certain docks by the city, remove it in scows to the Dorchester section of

the city and there dispose of it in a sanitary manner. The company is to receive \$47,400 a year for this work, regardless of the quantity treated. On arriving at the reduction works the garbage is unloaded, shovelled into conveyors, lifted and dumped into digestors, or closed steel tanks, and cooked with steam. This dissolves the grease, which, with considerable water, is squeezed from the tankage by roller presses. The grease and water go to settling basins, where the dirt sinks to the bottom and the grease rises to the surface, leaving the water between. The grease is pumped to tanks and afterwards barreled or otherwise made ready for sale. The water remaining is evaporated to a molasses like consistency, called stick, and is added to the tankage at a later stage in the treatment of the latter. The tankage, after pressing, drops into conveyors, and after drying while passing through an enclosed Archimedeian screw, passes to ammonia ovens of the Solvay-Semet type, where commercial ammonia is produced. The coked tankage, now quite dry, is screened and prepared to serve as a base in the manufacture of fertilizers. A process similar to this, with the omission of the ammonia adjunct, is in use for the treatment of the garbage of Greater New York and of Philadelphia. Pittsburg, Buffalo, Cleveland, Cincinnati, Detroit and St. Louis also have garbage reduction plants, operating under different systems, but with the common aim of recovering grease and fertilizer. All these plants are owned and operated by private companies and no definite and reliable figures regarding their cost of construction and operation can be obtained.

A refuse sorting and waste burning plant has also been put in operation at Boston, under a ten-year contract, but with another company. While the garbage plant is remote from the centre of Boston, the refuse plant is near the business centre. Paper and other light but bulky wastes are collected and brought to the plant by the city. Here they are thrown upon a long conveyor, lined on each side by men and boys, who sort out paper of different grades, rags, wood, glass and metal. The paper, rags and twine are thrown into shutes and go to baling presses, where they are made ready for sale. No salable matter, and nothing that will not burn, passes the sorters. The final refuse on the conveyors is automatically deposited in a huge furnace and there burned. It not only forms its own fuel but generates a sufficient amount of steam to drive the conveyor and a dynamo for electric lighting. This plant has a guaranteed daily capacity of 100 cu. yds., but it is claimed that it can handle at least twice this amount. The contractor, the City Refuse Utilization Co., receives \$5,500 a year from the city, and has the use of the site of the plant free of rental, and all proceeds from the sale of the refuse.

The garbage and refuse plants at Boston dispose of all the wastes mentioned above except ashes. These being reasonably clean and sanitary can be used for filling low land, or dumped at sea.

Garbage at Boston was formerly sold to farmers and others for the ostensible purpose of feeding it to hogs. The same practice still prevails in some other places. It is considered highly objectionable, on account of breeding trichinæ in the hogs, and because there is danger that it will be fed to milch cows, as well as hogs, to the great detriment of the milk. Garbage and other wastes are often dumped at sea, or in large lakes or rivers. Unless towed a long distance, and sometimes then, this leads to the littering of the water and adjacent shores with such garbage, paper and other matter as will float.

Many cities in this country, and still more abroad, burn their garbage in furnaces. English cities have achieved the most signal success in this respect. At Shoreditch, a vestry of London, the refuse destructor, as a garbage furnace is called in England, is operated in conjunction with a municipal electric lighting plant, aiding in developing steam for the latter. The combined plant is close by a municipal bath house and public library, which shows how inoffensive garbage disposal may be when properly conducted. The Shoreditch furnaces are said to be operated without the use of any fuel save the garbage itself, which there includes more combustible waste in the form of wood-working and other manufacturing refuse, and unburned or partially burned coal, than is the case with mixed garbage in this country. The gases of combustion pass through boilers for generating steam to aid in driving the electric light dynamos. As the heaviest amount of refuse reaches the works when the least amount of electric current is required, means were provided for storing the heat from the refuse furnaces until the busy hours for the lighting plant. To this end, thermal storage tanks were built, in which hot water was to be stored during the day for the more ready conversion into steam, and thence into current, at night. Although at the close of 1898, the Shoreditch plant had been in use about 18 months the contractors had only then succeeded in making the thermal storage tanks tight and the day demand for electric current was already so heavy that it seems doubtful whether thermal storage will be of any use. In general, it may be said that the history of municipal sanitary works shows repeated instances of over-sanguine plans for the utilization of city wastes. This is true of both sewage and garbage disposal. Where the commercial feature is introduced in such plants there is always danger that the sanitary results will suffer thereby, and these should of course always be paramount.

In America, Montreal and San Francisco have garbage furnaces closely approaching some of the most successful English types, and this method of garbage disposal seems likely to be widely employed. Furnaces are now in use at Philadelphia, Pa., Atlantic City, Camden and Trenton, N. J., Lowell, Mass., New Brighton, N. Y., Atlanta, Ga., and in many other cities and towns throughout the country.

GARNIER, JEAN LOUIS CHARLES, architect, member of the French Institute, died in Paris August 4, 1898. He was born in that city November 6, 1825; studied architecture, received a first class medal at the salon of 1863; was decorated with the cross of the Legion of Honor in 1864; and became an officer in the Legion in 1875. He designed the Grand Opera House in Paris, the theatre and gambling house at Monte Carlo, the Observatory at Nice, and the exhibits at the Paris Exposition of 1889, illustrating the development of human habitations.

GARY, JAMES ALBERT, Postmaster-General in the McKinley cabinet, was born of Puritan ancestry at Uncasville, Connecticut, October 22, 1833. He accompanied his parents to Maryland in 1840, and was educated at Rockhill Institute, Md., and Allegheny College, Meadville, Pa. In 1861 he entered into partnership with his father in Baltimore in the firm of James S. Gary & Son, which owned large mills at Alberton, Maryland; and upon his father's death in 1870, Mr. Gary succeeded to the head of the business and has conducted it since. He has other valuable business interests in Baltimore and Howard counties. For a number of years he was president of the Merchants' and Manufacturers' Association and is vice-president of both the Consolidated Gas Company and the Citizens' National Bank of Baltimore. He also holds directorship in a number of well known corporations. In 1858 he was nominated as a Whig for the State Senate and was defeated. During the Civil War, Mr. Gary was ardent in his support of the Union. In 1872 he was defeated for election to Congress and in 1879 was also defeated for the governorship. He was a delegate to the national Republican conventions in 1872, 1876, 1880, 1884, 1892, and 1896; from 1880 to 1896 he represented Maryland upon the Republican national committee. On March 5, 1897, he was appointed and confirmed Postmaster-General in President McKinley's cabinet; on April 18, 1898, solely on account of ill health, he resigned this position and three days later was succeeded by Mr. Charles Emory Smith.

GAS. See SEWER GAS.

GAS, ILLUMINATING AND FUEL. Prepayment meters, incandescent burners and gas stoves and heaters rent free or for low rentals, combined with steadily lowering prices for gas, are doing much to extend the use of this modern convenience. The prepayment meters are somewhat after the fashion of penny-in-the-slot machines; a coin dropped in a slot allows the consumer to use gas until a given quantity, corresponding to the value of the coin, has been consumed. Cooking lessons are being given free of charge by many companies to popularize the use of gas for fuel. Gas lighting for trains is also being rapidly extended.

GASES, GENERAL PROPERTIES OF. See PHYSICS (paragraph Ratio of the Specific Heats of Gases and Planetary Atmospheres).

GASTRO-ENTEROLOGICAL ASSOCIATION, AMERICAN. Next annual meeting at Washington, D. C., in May, 1899. President, D. D. Stewart, M. D.; Secretary, C. D. Aaron, M. D., 32 Adams ave., West Detroit, Mich.

GAULLIEUR, HENRI, a Swiss novelist and writer on governmental subjects, died in New York City, November 20, 1898, having been in this country only a few days. He was about fifty-five years old and was born in Geneva, Switzerland, where his father was a professor of languages in the University of Geneva. Mr. Gaullieur was graduated from this institution; later he received the degree LL. D. When about twenty-two he married Mlle. Sophie de Lentulus of Berne. After a time they went to Cuba and he bought a tobacco plantation near Santiago; in a few years they returned to Switzerland and in 1869 came to America, where he engaged in the tobacco business and became wealthy. In 1881 they returned again to Switzerland, their residence at the time of his death being at Kiesen near Berne. Mr. Gaullieur was a man of broad culture; he was an amateur painter and wrote several novels in English and German, depicting American life. Among them are *Maud Dexter* and *Capt. Ralph*. His last book, which was published by Harper and Brothers, New York, a few months before his death, was entitled *The Paternal State in France and Germany*, and was widely and favorably commented on by the press in America and England.

GEISSLER TUBES. See PHYSICS (paragraph, Roentgen Rays).

GEMS. United States.—The value of precious stones produced in the United States in 1896 was \$97,850, and in 1897, \$130,675. This includes sapphire, ruby, tourmaline, quartz crystals, smoky quartz, garnet, turquoise. The turquoise came chiefly from New Mexico, but some from Nevada, while deposits are also reported from California. During 1898 there was also an important development of the turquoise indus-

try at Turquoise Mountain, Mohave Co., Ariz., where ancient Aztec workings occur. Montana and Missouri furnished sapphires, but the stones are not of the best quality. Important discoveries of quartz crystal were made in Calaveras Co., Cal. The quartz occurred in gold gravels, and some of the crystals were sufficiently large to permit the cutting of balls 8 to 14 inches in diameter.

Foreign.—New discoveries of diamonds have been made on the Rietfontein farm about 20 miles from Pretoria in the Transvaal, and the yield of the famous Kimberley mines for the year ending June 30th, 1897, was £3,722,099. The diamond, opal and emerald mines of New South Wales have been worked with favorable yield, but the lack of water has interfered with the mining operations during much of the time. Mexico and New Mexico have continued to supply much of the opal demand.

GENERAL SOCIETY OF THE WAR OF 1812, organized in 1814, composed of lineal descendants of soldiers and sailors of the War of 1812. The federated State societies have for their President-General John Cadwalader, Philadelphia, and Secretary-General, Henry Hobart Bellas, Germantown, Pa. There are 1,800 members.

GENTIANOSE. From experiments made upon growing plants E. Bourquelot shows that gentianose, the specific sugar-like substance found in the roots of various of the gentians, like the sugar found in the roots of beets, is broken up into assimilable sugars, in the course of the growth of the plant, by special ferments which are localized in the growing parts of the plant. The soluble ferments of the black moulds, *Aspergillus niger*, invertin, and other ferments act in the same way; while emulsin, saliva and diastase are without action on gentianose.

GEOGRAPHICAL SOCIETY, AMERICAN, organized in 1852 has a membership of 1,200. The objects of the society are to encourage exploration, to extend geographical knowledge, and to establish in the first port of the country a place where all engaged in commerce or navigation may obtain accurate information about any port of the globe. President, Charles P. Daly; Secretaries, Chandler Robbins, Anton A. Raven, and William Libby, Jr. The office is 11 West 29th street, New York.

GEOGRAPHIC SOCIETY, NATIONAL. See NATIONAL GEOGRAPHIC SOCIETY.

GEORGE, PRINCE, of Greece was appointed High Commissioner of the powers in Crete in November 1898. He was born in Corfu, June 12, 1869, studied in Greece and in the naval school in Copenhagen and at the age of twenty received the grade of Lieutenant in the Royal Greek Navy. While traveling in Japan with the Czarevitch in May, 1891, he saved the latter from a murderous attack by a Japanese fanatic who assaulted the Czarevitch, but before he could renew his attack was struck down by Prince George. Later in 1891 Prince George visited the United States. During the Græco-Turkish War he commanded the Greek navy which, however, did not accomplish what was expected of it. His appointment as High Commissioner in Crete was received with favor by the natives as well as by the Greeks. See CRETE.

GEOLOGICAL SOCIETY OF AMERICA, founded in 1888, has 238 fellows. President, J. J. Stevenson, New York University; Secretary, H. L. Fairchild, University of Rochester.

GEOGRAPHICAL SURVEYS. A most notable and commendable feature in the works of the various State and Government geological surveys during 1898 has been the increased attention given to economic work, without neglecting entirely at the same time purely scientific investigations. The United States Geological Survey, has issued a number of special bulletins, atlas folios and monographs during 1898, in addition to the annual report of the director, which in the case of the eighteenth, recently published, consists of five large volumes. The work of the State surveys can perhaps best be judged from a mention of the more important papers contained in the reports issued in 1898, thus: Maryland, Reports on the Cartography of Maryland, and Building Stones; Indiana, Petroleum, Clays and County Reports; Iowa, Building Stones and County Reports; North Carolina, Gold Ores, and Clay Deposits; Georgia, Water Powers, Phosphates and Marls, and Gold Ores; New Jersey, Final Report on Physiography of the State; New York, County Reports and Palaeontological Monographs. The Canadian Geological Survey has issued its report for 1895 during the past year.

GEOLOGY. One of the greatest difficulties which geologists have had to contend with has been the attainment of uniformity in the naming, classifying and mapping of geological facts, and twenty years ago, this was brought up, as one of the purposes aimed at by the international congress of geologists. An insurmountable difficulty has been the correlation of European and American formations, it being found hard even to correlate the different European areas. In the U. S. alone, investigations have shown that the formations of each one of the great geological systems present such great diversity in their physical features, and in the particular composition of their faunas, that two, three, or four classifications are sometimes needed to present the true facts. Uniformity is probably only practicable in respect to the grander divisions, and diversity

is probably both practicable and necessary for naming the smaller ones. A recent commission of American and foreign geologists appointed for the purpose of discussing the question of nomenclature came to the conclusion that it was useless to attempt to preserve a rigid system of naming, and adopted a principle of elasticity in all matters of detail. They decided that units of the second order are the smallest division of the geological scale to which uniform name and position can be given in an international scheme of classification. They also adopted a set of prefixes (such as *paleo*, *meso*, *neo*), to be attached to the name of the system, as a method of reaching comparative uniformity in the naming of divisions of the third order. The local geologist is to select local geographic names, for divisions of the fourth order.

Physical.—The theory of Dana that all coral atolls have been formed on sinking land areas has been usually accepted, but during the past year Murray's hypothesis that in some cases at least atolls may form on rising land has received corroboration by the discovery that Christmas Island south of Java consists of a base of basaltic rock, capped by foraminiferal limestone which is a deposit formed in water far too deep for coral animals to live in. On this limestone is a mass of coral rock having the circular, rim-like form of an atoll with the central depression. This could only have been formed on the limestone after it had been raised to near the ocean level. A second elevation, or continuation of the first one has elevated the coral rock above the water, and a sea beach has been formed on the foraminiferal limestone. Recent work in the Fiji Islands by Prof. Agassiz is tending to further strengthen Murray's theory.

It has been found that the streams of the lower Mohawk Valley of New York State and the corresponding valley to the westward were, in preglacial times, tributaries of the Hudson and St. Lawrence rivers respectively, but glacial and aqueo-glacial erosion at Little Falls removed the divide and united the two. During recent geologic times temporary lakes also existed both east and west of Little Falls, being held in by barriers of ice or glacial drift. One important feature of the changes in topography produced by erosive action and grading by deposition in the valley during glacial and postglacial times was to make the region through central New York a natural thoroughfare of inestimable value commercially.

Recently completed observations of levels carried on over a period of 20 to 30 years in the region around the Great Lakes indicate that this region is being lifted on the North and depressed on the South, the actual direction of the tilting being south-southwest and such that the two ends of a line 100 miles long are relatively displaced four tenths of a foot in 100 years. If this movement continues, then, in 500 years Lake Michigan will overflow at Chicago during highwater stage, in 1,000 years the Great Lakes will discharge continuously both at Niagara and Chicago, and in 2,500 years Niagara will have ceased to exist.

Among the text-books dealing with this branch of science issued during 1898 are Davis's *Elementary Physical Geography*; Russell's *Rivers of North America* and *Volcanoes of North America*. R. S. Tarr in the *American Geographic Magazine* gives an important series of papers on the physical geography of New York State.

Petrography.—A memoir on the granite massifs of the Pyrenees by A. Lacoix deals with the peculiar and extensive contact metamorphism which has occurred in that region, and another work on the igneous rocks of Tasmania by Twelvetrees and Petterd gives an account of a hitherto little known region.

H. S. Washington has described the occurrence of *sölvbergite*, and *tinguaite* from Essex Co., Mass., which are of interest as forming a parallel series of rocks to those of the celebrated Christiania region of Norway. The Judith Mountains of Montana has been found to be of a laccolithic character, and the intrusions show acid feldspathic rocks of several different types, whose granularity of structure depends upon their chemical composition, and not on the depth at which they have been intruded. Six principal laccoliths have been found. Iddings suggests the term *Bysmalith* to denote a more or less cylindrical, or plug-shaped mass of igneous rocks, which has been pushed upwards from below. Mt. Holmes of the Gallatin mountains in the Yellowstone Park is an example of this. The occurrence of dikes of igneous rocks in the central and northern Appalachians is very unusual, for detailed work in various portions from Alabama to New York, has only resulted in the discovery of one in central Pennsylvania, and a small group west of Staunton, Va. Those found in Virginia have been added to by recent discoveries of some additional ones in Pendleton Co., West Virginia. F. L. Ransome has described a series of lava flows on the western slope of the middle Sierra Nevada, where in tertiary time no less than six successive volcanic beds were laid down. Between the flows, erosion took place resulting in the deposition of auriferous gravels. One of these streams flowed down a previously formed valley for a distance of sixty miles.

Among new text-books may be mentioned *Elemente der Gesteinslehre* by Prof. Rosenbusch.

Palaeontology.—A most important discovery has been the noting by Walcott of the

occurrence of well marked fossils from a horizon 4,000 ft. below the Cambrian beds in Montana. The remains are crustacean segments, related to the *Eurypterus* of the Upper Silurian, and are by far the earliest organic remains known. A monograph on the fossil *Medusae* or jelly fishes, also by Walcott, shows that in spite of the delicate structure of these animals, a surprisingly large number of fossils are found, but all those found in the United States belong to the Cambrian. C. R. Eastman's work on the Devonian fishes of Iowa, shows the presence of a highly interesting assemblage of forms, including several new genera, and by their occurrence bringing forth some interesting relations of palaeozoic problems. A study of the Devonian fauna at Naples, N. Y., shows that its characters bring it into close relationship with certain faunas of the same age in Devon, Eng., Belgium, the Rhine and Hartz districts in Germany, and the eastern and western slope of the Urals.

Foreign.—Data collected by the Jackson-Harmsworth expedition to Franz Josefs Land show the presence of deposits of the Jurassic age, whose interest lies in the fact that in the same beds are found ammonite and plant remains, showing that in Jurassic times a shore line existed in that region. Vast flows of basaltic lava subsequently covered up the soft Jurassic sediments and thereby protected them from erosion.

GEORGIA, a southern State of the United States with an area of 59,475 sq. m. Capital, Atlanta.

Mineralogy.—The great impetus that was given to gold-mining in Georgia by the incorporation of the British-Georgia Gold Mining Company, capitalized at \$5,000,000, was seriously checked in October, 1897, by the sudden return to England of the resident manager and the closing of the company's offices at Gainesville. Much consolation, however, was derived from the report of P. L. Noble, an experienced Denver miner, in January, 1898, which pronounced the gold fields of Georgia not only exceedingly rich but practically inexhaustible. Mr. Noble stated that the mineral belt runs diagonally across Alabama, Georgia, and North Carolina. Recently careful investigations have been made by the Georgia Geological Survey and by Mr. Becker of the United States Survey, and it seemed to be the opinion of geologists that there was no great gold-bearing reef or vein as in the case of Mother Lode of California. Georgia and Alabama are the only States in the country now producing bauxite, the raw material for aluminum, and in both States the industry is undergoing rapid development. The yield in both States in 1896 was 18,364 long tons and in 1897, 20,590. Alabama leads Georgia by about 4,000 tons, but Georgia has more than doubled her yield in three years, while Alabama's has fallen off.

Agriculture.—Official reports in 1898 indicated a general betterment in agricultural interests. The State held third rank as a cotton producer, with a crop of 1,350,781 bales, valued at \$38,272,680. Other leading crops and values were, corn, 26,586,648 bushels, value, \$12,761,591; wheat, 2,607,360, \$2,555,215; oats, 7,196,449, \$3,454,296; potatoes, 305,154, \$228,860; rye, 133,096, \$130,434; and hay, 199,222 tons, \$2,340,858—total value, \$21,471,260. While cotton and corn continued to be the most valuable crops, much more attention than formerly was being paid to the side branches of farming, especially in the line of products needed for home consumption. Live-stock comprised, horses, 110,266; mules, 158,594; milch cows, 297,324; other cattle, 423,018; sheep, 327,584; and swine, 2,093,987—total head, 3,410,773.

Manufactures.—In February 1898, the leading manufacturers of the State held a convention in Atlanta and organized a permanent association to promote a general industrial advancement. It was decided to seek a constitutional amendment giving to cities and towns the right to exempt manufacturing enterprises from municipal taxation by popular vote. There were 77 cotton and woolen mills, in the State, which in 1897-8 bought 285,219 bales of cotton for their own consumption, and several others were under construction or projected. The mill purchases of cotton were 25 per cent. larger than in the previous year. From 1890 till 1898 the number of spindles increased from 469,468 to 765,142. A scheme of much promise was developed early in the year, involving the creation of a high water power for electrical transmission by means of three dams in the Chattahoochie river, within a distance of sixteen miles.

Commerce.—During the fiscal year ending June 30, 1898, the imports of merchandise at the ports of Brunswick, St. Mary's, and Savannah aggregated in value \$423,264, and the exports, \$39,577,014, an increase in total trade in a year of \$8,693,777. The share of Savannah was, imports, \$391,634; exports, \$28,938,166.

Railroads.—The assessed valuation of railroad property in the State in 1898 was \$43,036,457. Governor Atkinson has urged on the legislature an enlargement of the powers of the State Railroad Commission, suggesting among other things that the Commission be given authority over street railroads and telephone companies, that it have control of the issuance of stocks and bonds of railroads, that it have speedier methods of enforcing its orders to compel railroads to accord immediately to the public rights which are due, and that it have power to regulate freighting and to prevent discriminations.

Education.—At the close of the school-year 1896-7 there were 715,300 persons of school age in the State, of whom 446,171 were enrolled in the public schools, and 246,683 were in daily attendance. The percentage of enrollment by races was, white, 58.62; colored 50.33. Public school property was valued at \$2,725,369, and the expenditures were \$1,765,972, including \$1,534,020 for teachers' salaries. There were 100 public high schools with 217 teachers and 4,652 pupils, and 85 private secondary schools with 245 teachers and 4,174 pupils; 2 public and 6 private normal schools; 11 colleges and universities, co-educational and for men only; 12 colleges and seminaries exclusively for women; and 2 theological, 3 law, and 4 medical schools. The State College of Agriculture and Mechanical Arts at Athens, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 357 periodicals, of which 28 were dailies, 273 weeklies, and 43 monthlies. Two schools modelled after Booker Washington's school at Tuskegee, Ala., have been established in Georgia. One is the Fort Valley Industrial School and is in a flourishing condition. It has an attendance of nearly 500 students, a full corps of teachers, comfortable buildings and a very fair mechanical equipment. It is open to colored students of both sexes. The boys are trained to be carpenters, bricklayers, blacksmiths, plasterers, etc., and receive instruction in scientific farming. The girls learn dress-making, cooking, fancy needle-work, telegraphy, stenography, millinery, typewriting, etc. There is a State grant of \$1,500 a year and the negroes have promised to raise \$3,000 more this year. The county also makes an annual appropriation for the school. A similar school has been opened at Greensboro with every prospect of success.

Banks.—On October 31, 1898, there were 29 national banks in operation and 15 in liquidation. The active capital aggregated \$3,916,000; circulation, \$1,311,341; deposits \$7,418,245; and reserve \$2,152,150. The State banks, May 5, 1898, numbered 119, and had capital \$9,146,842; deposits \$17,530,380; and resources \$32,792,829. The exchanges at the United States clearing houses at Macon, Savannah, and Atlanta, in the year ending September 30, 1898, amounted to \$223,950,348, an increase of \$4,997,224 in a year. At the close of 1897 the legislature provided for the appointment of a State Bank Commission and also passed a bill authorizing the State banks to issue circulating notes and empowering the Governor to take legal action to prevent the collection of taxes from these banks under Federal laws.

Finances.—The recognized bonded debt, October 1, 1898, was \$8,039,000, besides a floating debt of \$90,202—total \$8,129,202; contingent liabilities, \$464,000; total assessed valuations \$409,357,449; State tax rate \$6.21 per \$1,000.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 2,235,000. The local estimate for Savannah was 65,000.

Legislation.—An act was passed giving authority to State banks to issue their obligations payable in silver bullion, said obligations not to be similar in appearance to national bank notes or Federal currency, and not to be issued to an amount greater than 50 per cent. of the fully paid up, unimpaired capital stock of the bank issuing the same. Private bankers are made subject to examination by the State Bank Examiners, and are required to make reports such as are now required of incorporated banks. They must also have the words "Not incorporated" stamped upon their stationery, letter heads, and envelopes. The franchises of an insolvent corporation are declared to be assets, which may be sold, under the order of the court, through a receiver or otherwise. All building and loan associations incorporated under the laws of the State must deposit with one of the legally authorized State depositories, or trust companies, 75 per cent. of the amount of all mortgages or other securities received by them in the usual course of business. Regulations are made for mutual insurance companies formed to insure against loss or damage arising from burglary, robbery, or attempt thereat, and to insure against the loss of money or securities in course of transportation by registered mail. All life insurance companies doing business on the assessment plan must print on every policy or benefit certificate the words, "This contract is issued upon the assessment plan;" and also the words "Assessment plan" upon every application, circular card, advertisement, and other printed document. Companies organized for the purpose of generating electricity for lighting towns or cities, or for supplying motive power to railroads or street car lines, or supplying light, heat, or power to the public, receive the right to purchase, lease, or condemn rights of way or other easements necessary for such purposes, upon the lands of others, upon first paying just compensation to the owners of said lands. It is made a misdemeanor to injure or destroy the wires, meters, or other apparatus of electrical companies, or to divert any electrical current from the wires, or without the consent of the company, to use any electricity manufactured or distributed by such company.

Law Relating to the Treatment of Convicts.—A law came into operation amending the treatment of convicts. Under the old law governing misdemeanant convicts, in some counties unauthorized leases fostered abuses and sometimes cruelty, but the new act puts an end to this. The complete management and control of the State convicts

is intrusted to a Police Commission of three members. Able-bodied male convicts are still to be hired out; all others are to be kept in prisons and stockades and on farms to be procured and directly controlled by the Commission. Under the old system Georgia received \$25,000 a year for her convicts and it is expected that this new law will raise this to \$75,000 or \$100,000. There are about two thousand convicts all told. The new commissioners are doing their work so well that it is expected that there will be no future charges of cruelty. The convict-laborers are under the care of guards appointed by the commissioners. The commission also constitutes a board of pardons that must investigate all applications for executive clemency and make recommendations to the Governor as to granting the same.

The Library Commission.—A State Library Commission of five members was also appointed. It must give advice and counsel to all libraries in the State, and to all communities that purpose establishing them, as to the best means of establishing and administering such libraries, selecting books, cataloguing, and other details of library management. The Commission must make biennial reports to the Governor. No member of the Commission is to receive any pay or travelling expenses, nor is the State to pay any expense incurred by the Commission for services or travelling.

Admission to the Bar.—Oral examination for admission to the bar ceased on Aug. 1; in future all candidates must undergo a written examination prepared by the Supreme Court, which shall also fix the dates in each year when the examinations are to be held. The examinations are to be supervised by the judges of the Superior Courts under rules adopted by the Supreme Court, and are to be forwarded to the Supreme Court which shall pass upon the merits of said examinations and upon the admission of the candidates. The latter are to sign the examinations by numbers, so that the name of each candidate may not be known until after his admission or rejection. This act does not apply to graduates of duly authorized law schools, nor to those who have been admitted to the practice of the law in other States which by comity admit to practice the duly licensed lawyers of this State.

Law Relating to Land Titles.—An act was passed for the relief of *bona fide* settlers and others possessed of defective title. In actions for recovery of lands *bona fide* held under adverse claim of title, in case title is found to be in the plaintiff, the defendant is permitted to set off the value of the permanent improvements *bona fide* placed thereon and to recover a verdict therefor in excess of the mesne profits.

The Tax on State Bank Notes.—Georgia has also devised a plan to test again the constitutionality of the national 10 per cent. tax on State bank notes. A commission has been established with power to issue circulating notes to any bank. If an attempt is made to levy the ten per cent. tax, the Attorney-General is required to carry the case to the U. S. Supreme Court.

The Boundary Question.—Much excitement was manifested regarding the Georgia Boundary Question. The Attorney of the State Mr. Wimbish filed his report with Governor Candler on Georgia's claim to 1,500 square miles of territory lying in Tennessee and North Carolina, and therefore Chattanooga (q. v.), according to this claim, belongs to Georgia.

Shaker Colonies.—The Shakers, who have large colonies throughout the United States, purchased Altama and Hopeton plantations in Glynn county after twelve months of investigation in the Southern States. It is thought to be the beginning of a movement whereby the entire Shaker colony will concentrate in Georgia. Another purchase of 51,000 acres in Charlton, Pierce, and Ware counties was made.

Representatives and State Officers.—Georgia's eleven representatives to Congress are: Rufus E. Lester, from Savannah, James M. Griggs, from Dawson, E. B. Lewis, from Montezuma, W. C. Adamson, from Carrollton, L. F. Livingston, from Kings, C. L. Bartlett, from Macon, J. W. Maddox, from Rome, W. M. Howard, from Lexington, F. C. Tate, from Jasper, W. H. Fleming, from Augusta, and William G. Brantley, from Brunswick. Augustus O. Bacon (Dem.), from Macon, and Alexander S. Clay, from Marietta (Dem.), are the Senators. The officials are: Allen D. Candler, Governor; Philip Cook, Secretary; W. I. Speer, Treasurer; W. A. Wright, Comptroller; P. G. Boyd, Adjutant-General; J. M. Terrell, Attorney-General; G. R. Glenn, Superintendent of Education; and O. B. Stevens, Commissioner of Agriculture. All are Democrats. Chief Justice, Thomas J. Simmons; Associates, Samuel Lampkin, Henry T. Lewis, Andrew J. Cobb, William A. Little and William H. Fish; and Clerk, Z. D. Harrison. There are 213 Democrats, 1 Republican, and 5 Populists in the State legislature.

GERMAN ARCHÆOLOGICAL INSTITUTE. See ARCHÆOLOGY (paragraph Greece).

GERMAN EVANGELICAL SYNOD OF NORTH AMERICA. In 1898 this religious sect devoted its attention to strengthening and developing its existing congregations and institutions rather than extending its branches. The General Conference met at Quincy, Ill., in September, and selected Dr. Paul L. Menzel of Richmond.

Va., to represent the Evangelical Synod at the dedication of the Evangelical Church in Jerusalem, Oct. 31, 1898; the constitution was partially resolved; a board for home missions was established; the publication of a hymn-book in the English language was authorized; and resolutions were passed regarding the enlargement of its publishing-house, and the celebration of the semi-centennial of its theological seminary, Eden College, July 4, 1900. The year's record shows 872 ministers, 1,130 churches, and 199,234 members.

GERMAN LITERATURE. History.—If we accept the numerous biographies and memoirs which have historic interest there were comparatively few volumes of history published in the year 1898 which possess any great importance. A curious work, of unusual erudition, and one which belongs quite as much to the department of philosophy as of history, is Prof. P. Barth's *Die Philosophie der Geschichte als Sociologie*. The author's aim is to show that the evolution and the various phases of society are the true objects of history. Two important works that bear upon the history of mediaeval Rome are *Geschichte Roms und der Päpste im Mittelalter*, by Prof. Hartmann Grisar of Insbrück, the first volume of which has just appeared; and Prof. Otto Seeck's *Geschichte des Untergangs der antiken Welt*, which has been in the course of publication since 1897. Prof. Seeck claims that the Emperor Constantine, usually somewhat disparagingly treated by historians, really did deserve the epithet "Great" bestowed upon him by the Christians. Other volumes dealing with Mediaeval history are H. Frankfurth's *Gregorius de Montelongo*, described as "a contribution to the history of Upper Italy in the years 1238-69;" *Papst Silvesters II. Einfluss auf die Politik Kaiser Ottos III.*, by C. Lux; and *Zur Geschichte Polens im Mittelalter*, by Max Gumpowicz. Worthy of mention also are R. Werner's *Bilder aus der Deutschen Seekriegsgeschichte von Germanicus bis Kaiser Wilhelm II.*; the second part of H. Friedjung's *Der Kampf um die Vorherrschaft in Deutschland, 1859-66*; and the initial volume of H. Kraemer's *Das XIX Jahrhundert im Wort und Bild: Politische und Kulturgeschichte*. A work of uncommon interest, for its bearing upon the Franco-Prussian War, is *Pariser Gedächtnisblätter*, consisting of the diary of Wilhelm Cahn, who as attaché of the Swiss embassy, was in Paris throughout the war, the siege and the succeeding days of the Commune. A curious volume is the "Jubilee-edition for the German People," of Hans Blum's *Die Deutsche Revolution von 1848-49*, containing a large collection of contemporary caricatures, pamphlets, and manifestoes.

Biography.—The year 1898 has a two-fold historical interest, as the jubilee year of the Revolution of 1848, and as the year of the death of Prince Bismarck; and each of these circumstances has called forth a number of memoirs and biographies of considerable historical importance. To the former category belong two works which treat the events of that troubled period from diametrically opposite standpoints; *Erinnerungen eines Achtundvierzigers*, by Stephan Born, a companion of Engel and of Marx, and one of the first champions of the German socialists; and *Aus Meinem Leben*, by Prince Kraft zu Hohenlohe-Ingelfingen, known not only as Adjutant-General of Emperor William I, and commander of the Artillery during the siege of Paris, but also as author of *Militärische Briefe* and numerous other technical works on the art of war. Of the great mass of Bismarck literature which has appeared during the last few years, the first place must necessarily be conceded to Bismarck's own *Gedanken und Erinnerungen*, published simultaneously in German, French and English. Of scarcely less interest, however, are the recent Bismarck Memoirs by Dr. Moritz Busch, although these belong to the domain of politics rather than of literature. (See article BISMARCK.) The three principal biographers of Bismarck, however, are Ludwig Hahn, Heinrich von Poschinger and Horst Kohl, author of the *Bismarck-Regesten*, (Leipzig, 1892), and since 1894, of an annual *Bismarck Jahrbuch*. Bismarck's *Politischen Reden*, edited by Kohl in twelve volumes, have recently been issued in a popular edition, in the well-known Universal-Bibliothek. In addition to publishing Bismarck's correspondence, Von Poschinger is author of such important works as *Fürst Bismarck und die Parlamentarier*, (Breslau, 1894-96), and *Fürst Bismarck's Ansprachen; 1848-94*, (Stuttgart, 1894), besides a series of *Tischgespräche* and an annual *Bismarck-Portfeuille*. Works belonging to the last months of 1898 are the sixth, seventh and eighth volumes of Johannes Penzler's vast work *Fürst Bismarck nach seiner Entlassung*; a supplemental volume by Blum, bringing his *Fürst Bismarck und seine Zeit* down to the time of his death; and Horst Kohl's *Denkwürdige Tage aus dem Leben des Fürsten Bismarcks*. Among other important works relating to Bismarck it was announced that the following would be ready for publication early in 1899: Von Poschinger's *Neue Tischgespräche und Interviews; Bismarck Posthumus*, by Ludwig Bamberger; *Bismarck's Humor, Heiteres aus dem Leben und Wirken des Altreichskanzlers*, by Alfred Gottwald; and lastly *Bismarck in der Caricatur*, a collection by R. Walther, of upward of 230 caricatures from French, English, Russian, Italian, American and German sources. Von Poschinger also published last year a life of *Kaiser Friedrich; in neuer Quellenmässiger Darstellung*.

GERMAN SOUTHWEST AFRICA is a German protectorate on the African coast between Portuguese Angola on the north and Cape Colony on the south. The estimated area is 322,450 square miles and the population about 200,000 of whom 2,628 in 1897 were whites. The British possessions of Cape Colony and South Africa shut it off from the interior but a narrow strip extends along the southern boundary of Angola as far as the junction of the Chobe and Zambesi rivers. Its coast stretches for 330 miles from the Cunene river to Orange river, but is broken for a short distance by Walfisch bay which belongs to Great Britain. Its climate and physical features are sub-tropical, although two-thirds of the land lie in the tropic zone. The temperature is moderate except in a few parts of the colony and the air of the fertile upland plains is singularly dry and bracing. The days are hot but during the night frost frequently occurs. The rainy season occurs in December and January. The streams are nearly dry in summer but there are said to be good facilities for irrigation. Most of the native inhabitants belong to the Hottentot, Bantu and Damara races. The principal settlements are Windhoek, Gobabis, Otjimbingue, Gibeon, etc. Walfisch bay, belonging to Great Britain, is by far the best harbor on the coast, but the Germans possess Sandwich harbor, Lüderitz bay and the new harbor of Swakopmund which is connected by railway with Windhoek. The seat of government is Great Windhoek in the interior about 180 miles east of Walfisch bay. In spite of its natural advantages the agriculture of the colony has not been developed, the natives not having advanced beyond the pastoral stage. Large numbers of cattle, sheep and goats are raised, especially in Damaraland. Gold, copper, and other minerals have been found. The government is a protectorate under an imperial commissioner.

The history of the colony affords a good illustration of the slowness of the Germans to appreciate the value of African possessions. It was purchased in 1883 by Herr von Lüderitz and in the following year placed under imperial protection. The unattractive aspect of the coast with its shifting sand dunes gave the impression that the land was worthless. Access to the interior could be had with difficulty for the British possessed the only good harbor of Walfisch bay. In spite of all this Lüderitz believed that the interior contained valuable lands and that an export trade might be developed in ivory, ostrich feathers, guns, skins, and horns, for it was known that these products had been obtained from this region in previous years. He died, however, before he had a chance of verifying his surmises. The German government, doubtful of the value of these lands, hesitated to purchase them from his heirs and accepted the offer of a syndicate formed in 1885. This syndicate managed the province badly and it is said that as late as 1890 Count Caprivi was ready to cede it to Great Britain. But gradually the public opinion was interested in the colony and the belief in its value gained ground. In the meanwhile, however, the government had made concessions to English companies to the disadvantage of the Germans. During the last few years the colony has progressed. Its governor, Major Lutwein, has tried to promote immigration as well as to stimulate domestic trade. The farms are not carefully tilled but are rather of the nature of ranches. The great obstacle to economic progress has been the rinderpest which, however, seems to be under control. The development of the colony is said to be hindered by the bureaucratic spirit of the government. A German writer in 1898 (F. Bley, formerly governor of German East Africa) complained of the policy of excluding the Boers from the country. He considers these people the most desirable of immigrants, being "industrious, temperate, tough in body, and above all experienced particularly in just those things which pertain to South African farming and cattle raising." He says, "The struggle between the Dutch and English in South Africa would be accelerated to an end if a power like Germany afforded open aid to the Dutch. At present the Boers wish to become neither German nor English but they will be unable to resist subjection in the long run of time; and as natural affinity will draw them ultimately to the lap of Germany, the better it will be for the Germans, the more widespread and prosperous they have become. The government ought to leave no stone unturned to encourage its subjects to try to extend and appreciate the peculiar ways and opinions of the Boers. The future of the white race in Africa depends upon the rapidity with which a mutual understanding between the two Teutonic branches of it can be developed. The German government may be brought to perceive this and to let minor political consideration drop into abeyance in order to adjust its policy in accordance with the one great question at stake. But at present its task appears to be to seek colonial aggrandizement *per se*; it is even emulating Great Britain in encouraging colonial commerce, all of which is a great step in advance beyond its former indifference to matters colonial. The final comprehensive grasp of the subject of African colonization, however, from the point of view of the political future is still wanting. At least no evidences of such grasp of the subject are visible as yet to men working in Africa."

GERMANY occupies the central portion of Europe and consists of 58 states with an area of 208,830 sq. m. (including Alsace Lorraine), with a population on December 2, 1895, of 52,279,915.

Natural Products.—Germany has great mineral resources, especially in Prussia, where the larger part of her mineral wealth is produced. The minerals include coal, lignite, iron ore, zinc ore, potassic salt, rock salt, lead ore, copper ore, etc. The vegetable products are also various and abundant. All the ordinary cereals are extensively cultivated and besides these, hemp and flax, madder, wool, saffron, tobacco, hops and a variety of vegetables and fruits are raised. According to the figures for 1896-97, the chief cereal crops were rye, oats, wheat and barley and of other natural products, potatoes, hay, beet root and wine were the most important. As to the acreage under the principal crops the largest in 1896-97 was devoted to the raising of rye and next came hay, oats, potatoes, wheat and barley. Great efforts are made to encourage agriculture in all the states.

Manufactures.—Germany has made great progress in the industrial arts, especially during the last twenty years, and this has been attributed in part to the encouragement and direction afforded by the Imperial and State governments. Among the chief industries may be mentioned the mining of coal, the manufacture of coke, pig iron, steel billets, machinery, seed oils, potash salts and the linen and woollen industries. The consumption of coal, which is to some extent an index to the condition of manufactures, has steadily advanced, and though the domestic supply has increased, it has not been sufficient for the great increase in demand and Germany imports a considerable quantity of coal from abroad. A review of the condition of German industries published in 1898 draws attention to the continued prosperity and activity in all fields of German industry during the previous year. The number of industrial companies organized in 1896 was 182, while in 1897, 254 were formed with an aggregate capital of \$90,551,860, an increase of nearly a third over the capital of the companies organized in the previous year. Efforts have been made to improve German manufactures of machinery and with success, although American machinery is still extensively used in Germany. In the iron and steel manufactures Germany is one of the leading countries of the world and in the manufacture of beet root sugar it stands at the head of European nations.

As to industrial conditions in the year 1898, no official figures were available at the close of the year, but the following statements are of interest: The railway freight traffic increased, having risen steadily from 151,000,000 tons in 1890 to 218,000,000 tons in 1898. In Prussia the state railways yielded an increase of about 50,000,000 marks. There was also an expansion in the money market in 1898, the loans floated amounting to 1,532,000,000 marks compared with 695,000,000 marks in 1890. The centralization of industry has also continued. The extent to which small industrial concerns were transformed into companies is illustrated by the great value of the shares issued in 1898. It was reported that the number of large retail stores in Germany had vastly increased. These establishments seem to have been modelled on those in the United States and to have aroused something of the same kind of opposition there as here. In some of the German cities the governments have discriminated against these department stores as for instance in Dresden, where a local law taxes stores whose annual sales exceed a certain amount and in the Prussian Diet it was announced that a bill would be presented by the government imposing a special tax upon these large establishments, which are known in Germany as *warenhäuser*.

Commerce.—The principal exports of Germany are textiles, metal and metal wares, "articles of consumption," chemicals and drugs, leather goods, machinery, etc. In 1896-97 the total exports of sugar from Germany reached the extraordinary figure of 2,616,776,425 pounds, of which nearly one-half went to England. In 1896 the leading countries to which Germany exported goods were, in the order of their importance, Great Britain, Austria-Hungary, the United States, Russia, the Netherlands, Switzerland, France and Algeria, and Belgium, and the leading countries from which she imported goods were, in the order of their importance, Great Britain, Russia, the United States, Austria-Hungary, France and Algeria, Belgium, the Netherlands and Switzerland. In that year there was a considerable increase both in imports and exports over the previous year. Recently Germany has attained in commercial and industrial importance a place second only to Great Britain among European nations. According to the statistics published in the United States Consular Reports, at the close of the year 1898, it appears that the officially estimated figures for the foreign trade of the five years ending with 1897 showed great increase in both exports and imports since the year 1893. In 1897 the increase over the total foreign trade of 1896 was estimated at \$93,000,000, the imports for 1897 being \$1,150,228,058, and the exports \$906,335,178. For many years there has been an annual excess of imports over exports amounting in 1897 to nearly \$243,000,000. This is due to the fact that Germany with her large population cannot raise meats or bread-stuffs in sufficient quantities for home consumption, and it is these articles together with several staple raw

materials that swell the value of her imports. As to the trade with the United States, the most noteworthy articles of import into Germany from this country were raw cotton, corn, copper, petroleum, meats, hides and skins, oil cake, lumber and timber, rye and barley. There was a considerable decrease of the exports from Germany to the United States, owing it is said to the United States' tariff law of 1897. This loss fell heavily upon the districts of the textile manufactures, Crefeld, Barmen, Sonneberg and Aix-la-Chapelle. This decrease attracted considerable attention in Germany, where, in some quarters a resort to a retaliatory policy was favored. (See the articles UNITED STATES and TARIFF.) In 1897 the importation of Indian corn from the United States increased about 76 per cent., owing in part to the growing tendency to use corn as a bread-stuff as well as for fodder and for distillation. The importation of wheat on the other hand declined considerably in 1897 as compared with the previous year. The importation of leather from the United States has also shown a steady growth in recent years in spite of the tendency of the Germans to adopt American methods and equip their plants with American machinery. Fresh fruit is another item which the Germans have been importing in increasing quantities from the United States but its importation was checked in 1898 by the restrictive policy of the German government in respect to this class of products. (See the article TARIFF.) Testimony to the extraordinary development of German enterprise was afforded by a report published by the British foreign office, dealing with the history of the German trade and shipping from 1872 to 1897. Within this period it was said that Germany's foreign trade had increased 60 per cent. and that her merchant marine had more than kept pace with it, having trebled since 1871. In coasting trade as well as in ocean traffic there was an enormous increase. The facilities supplied for technical and commercial education were highly praised as resulting in the greater skill and efficiency of those engaging in these occupations. Official figures for the foreign trade of the Empire during the year 1898 were not available at the close of that year, but on the basis of estimates it was said that the export trade of the Empire, in spite of the falling off in the exports to American countries, had increased in 1898 as compared with 1897. For a brief account of the commerce of Germany with South American countries, see the article SOUTH AMERICA.

German Coal Trade.—Imports and exports of fuel in Germany for the calendar year 1898 were as follows in metric tons:

	Imports.		Exports.	
	1897.	1898.	1897.	1898.
Coal	6,072,029	5,820,332	12,389,907	13,989,223
Lignite	8,111,076	8,450,149	19,112	22,155
Coke	435,161	332,578	2,161,885	2,133,179
Briquettes	79,450	62,239	247,722	325,408

This shows a surplus of exports over imports in 1898 of 8,168,891 tons of coal, 1,800,601 tons of coke, and 263,169 tons of briquettes; an excess of imports of 8,427,994 tons of brown coal, or lignite.

Foreign Trade Policy.—German political opinion is divided upon the question of foreign trade policy. The Agrarians favor the establishment of a strict protective policy in regard to meats and cereals and would put an end to the concessions guaranteed by commercial treaties. The industrial group on the other hand favor the lowering or abolition of the duties upon foreign meats and bread-stuffs in order to lower the cost of production in manufactures; and the commercial group advocate free trade and the extension in every possible way of foreign commerce. The Germans have shown great activity in recent years in the opening up of foreign markets for their goods, especially in the Far East, where they have been making elaborate scientific study of the commercial opportunities.

The German Colonies.—The German colonial system dates from 1884 when her extension of empire beyond the limits of Europe began. According to the latest available figures in 1898 her foreign protectorates included an area of over one million square miles, with an estimated population of 10,600,000, the most important of the colonies being in Africa. The chief German colonies are Togoland, Cameroon, German Southwest Africa and German East Africa. Besides these there are several island groups in the Pacific, including Kaiser Wilhelm's Land, Solomon Islands, the Bismarck Archipelago and Marshall Islands. Finally there is the recent German acquisition of the Chinese harbor of Kiao-Chau with certain rights over the adjacent territory (see CHINA). The most important of Germany's colonies, especially Togoland, Cameroon and German Southwest Africa, showed, according to the latest published statistics, an excess of expenditures over revenue. It was reported in 1898 that the Imperial contributions to the colonial revenues had greatly increased over 1897 and that the value of the goods exported to the German colonies did not exceed the sum of these contributions. It was also stated that in 1898 Kiao-Chau alone cost the

Imperial government the sum of £425,000. As to the colonies in Africa, it was reported in the Consular Reports for 1898 that the total value of the trade between the German Empire and the African colonies amounted in 1896 to \$2,837,000, of which \$534,500 were imports. The white population of the African colonies was estimated at 3,580, of whom all but 1,778 were Germans, 1,350 being officials and soldiers. For a further account of the German colonies, see the special articles.

Railways, etc.—The larger part of the railways of Germany are owned by the Imperial government or State governments. In 1896 there were 28,882 miles open for traffic and of this only 2,817 miles belonged to private companies. The canal system at the beginning of 1897 had a total length of 8,654 miles. In 1898 a new canal was in process of construction comprising a line joining the river Rhine with the Dortmund-Ems canal and another line joining the latter with the river Elbe. When completed this will unite the North German waterways and cheapen transportation throughout a large part of the Empire. In 1896 the mileage of telegraph line was 84,370.

Finance.—The main sources of revenue for the Empire are customs and excise duties, federal contributions, and the posts, telegraphs and State railways. The budget estimates for 1897-98 were, for revenue 1,295,468,000 marks and for expenditure 1,307,576,000 marks. The federal contributions are levied according to the population at a certain rate fixed each year in the Imperial budget. The estimated revenue for 1898-99 was £69,157,400 and the estimated expenditure £70,561,800. The public debt in 1897 was £113,063,000. The monetary unit is the mark, which is equivalent to 23.8 cents in United States currency. The monetary system is gold monometallism. On January 1, 1898, the stock of gold in Germany was estimated at \$668,500,000. See the article **MONEY**.

Army and Navy.—The law of August 31, 1893, to remain in force until March 31, 1899, provided that the peace strength of the army should be 479,229 men. In 1897 the peace footing was 562,352 men and 23,088 officers. The re-organization undertaken on April 1, 1897, was completed in May, 1898. As a result the number of infantry battalions was increased from 538 to 626 and the number of regiments from 173 to 215. In 1898 the mobilized strength of the army was estimated at nearly four million men. (See succeeding paragraph on Measures before the *Reichstag*.) In December, 1897, there were 16 battleships and 1 in process of construction; 19 coast defence ships; 8 cruisers and 2 in process of construction; 114 torpedo craft and 6 in process of construction; and 12 lookout ships. In 1898 a new naval programme was begun. According to this it was intended that the fleet should include 24 battleships; 32 cruisers; 11 dispatch vessels; 4 gunboats; and 113 torpedo boats. A number of important vessels were in process of construction during the year.

Emigration.—The great tide of emigration set in toward the close of the seventies. In 1881 the number of emigrants was 220,902, which surpassed that of any previous year. Since then it has declined and for several years following 1885 it averaged about 100,000 annually. In 1892 it was 116,339. The decline since then has been rapid and in 1896 it was 33,824, little more than the average annual number for the period of 1874-78. By far the greatest number of the emigrants went to the United States. In 1896, 29,007 went to that country and 1,001 to Brazil and 2,152 to other American countries; Africa, Asia and Australia receiving the rest. In the year ending June 30, 1898, the emigrants to the United States numbered only 17,072.

HISTORY.

Political Situation.—Before describing the events of the year 1898 it may be of interest to review the recent history and present status of the political parties of Germany. In point of rapidity of progress the Social Democratic party of Germany leads all the rest. It will be remembered that between the years 1878 and 1890 this party was the subject of a law which the *Reichstag* passed under the influence of Prince Bismarck. The crime of Hödel and Nobiling, who tried to assassinate the old Emperor William I, was on somewhat doubtful evidence fastened on the Social Democrats. They were in consequence subjected to repressive legislation, and at the same time Bismarck made a bid for the support of the workingman by measures of what has been called State or Imperial socialism as illustrated by the law for the compulsory insurance of workingmen. In spite of repressive measures and in spite of the attempt of the government to win the workingman's favor, the Social Democratic party continued to thrive. In 1877 the election returns showed that the Social Democrats obtained nearly 493,000 votes. Ten years later 763,000 votes were recorded for them, and in 1890 the number was 1,427,000. In the election of 1893, the number of votes rose to 1,786,000, and in 1898 to 2,100,000 in round numbers. But in spite of this large popular vote the number of their seats in the *Reichstag* was comparatively small, for the Social Democrats had in 1898 but 56 out of 397 seats, yet the large number of political parties in Germany is in part accountable for this, and the Social Democrats in several important instances have cast the deciding vote. Outside of Germany the Social Democratic party is viewed as a very radical organization with aims which if

realized would overthrow the present capitalistic organization of society. As time has gone on, however, the more practical members of this party have seen that it is only by gradual steps that these ultimate aims can be realized. The methods of the party, therefore, are quite distinct from its aims. In aims it is revolutionary, but in all matters of method it is hardly to be distinguished from some of the other parties. For instance, it has voted with the Liberals against the raising of the taxes on necessities and against bimetallism, and it has opposed the attempt of the land-owners to turn the *Reichsbank* into a State institution, acting in the latter instance on the principal that it was bad policy to strengthen the hands of the present government. As the opposition party to the government it has become the refuge of malcontents of all sorts. This as well as the prevalence of socialistic ideas accounts for its rapid increase. See SOCIALISM (paragraph Germany).

The Liberal party in recent years has apparently lost ground. During the ten years following 1866 they were very prominent, and most of the legislation at that period bore traces of their principles. For instance, they upheld the freedom of the press, and of industry; the adoption of the single gold standard and the system of banking which was finally put into effect. During this time Bismarck inclined toward the Liberals, but abandoned them as soon as it was seen that they desired a share in the government. The party afterwards, became weakened by divisions. The German People's party, the South German People's party, and the Liberal Union party, all stand on the strongly liberal platform. The National Liberal party in point of numbers nearly equals the Social Democrats. If all the Liberal parties were welded together it is evident that they would make one of the strongest groups in the *Reichstag*, and efforts have recently been made to unite them. Union has been prevented, however, largely on account of the personal rivalries of the leaders. Among these leaders the most notable is Eugen Richter, the chief of the South German People's party.

The Centre party is composed of Ultramontanes, that is, Roman Catholics, whose political platform has been shaped largely by the attempt of Bismarck to withstand Papal influence. The party, therefore, dates from the period of the *Kulturkampf*, and may be regarded as a product of the May laws. In constitutional matters it votes chiefly with the Left and on economic questions with the Right.

Another important party group is the Conservatives, who as a result of the elections of 1898 held 53 seats in the *Reichstag*. The majority consists of the old Prussian landed aristocracy (the Junkers), and the minority, known as the independent conservatives, are less reactionary in their views. A leading member of the Conservatives is Count von Kanitz, who has made himself famous in his efforts to aid the home producers of grain. These are the principal groups, but there are smaller parties, such as the Alsace-Lorraine Deputies, Poles, Guelphs and Anti-Semites.

It would appear from this that Germany has not reached the stage of development at which two great political parties divide the field. The result is that the issues are indistinct and the ministry cannot tell beforehand to what parties to look for support for its measures. Much of the confusion in German politics which often renders them almost incomprehensible to the American or the Englishman is due to this fact.

The present Chancellor of the Empire is Prince Hohenlohe-Schillingsfürst, whose policy has in the main been conciliatory toward the parties in the *Reichstag*. He has not imitated Prince Bismarck in the latter's brusqueness or his tendency to bully the opposition into compliance, nor has he been as direct and straightforward as his predecessor, Count von Caprivi, but he has shown himself a sagacious statesman and has exercised much discretion in the choice of his secretaries. The Secretary of State, Bernhard von Bulow, won popular favor by the successful outcome of Germany's colonial policy. The acquisition of Kiao-Chau took place soon after his entry into office, and his policy in regard to this acquisition met with favor from common-sense people of Germany. He declared that it was not to the interest of Germany to monopolize the trade of any portion of the Chinese Empire, but to "live and let live."

The Naval Secretary, Rear Admiral Tirpitz, has thrown in the weight of his influence with the policy for the increase of the navy. The demand is for seven battle-ships of the line, two large armor-plated cruisers, and seven small cruisers to be added to the present navy within a period of seven years and at an expenditure of a sum not to exceed 200,000,000 marks. Whether or not this accession to the navy has anything to do with Germany's designs in regard to the Far East is a question not yet decided.

The most important question at present agitating German politics is the Agrarian question. This question has arisen in consequence of the great expansion of all German industry. Some fifty years ago almost all of the food that was consumed in Germany was raised within its limits. Her total imports and exports amounted to between 1,000,000,000 and 2,000,000,000 marks. In 1896 the imports had risen to 4,558,000,000 marks and the exports to 3,753,000,000 marks. Of this, 2,000,000,000 marks represents the amount of agricultural and forest produce imported. The

increase in the amount of food consumed by Germany is of course due to the great increase of the population, which has risen from 35,000,000 in the middle of the century to 54,000,000 at the present time; but while the increasing amount of imports is a sign of the general advance of Germany in industrial matters, it has pressed with great severity upon the agricultural classes. Just here is the root of the Agrarian difficulty. The Agrarians wish protection for the home producer of agricultural products. They are opposed to that policy of commercial treaties by which the administration of Count Caprivi won renown. Besides annulling these commercial treaties they advocate the establishment of a bimetallic standard. The nucleus of this Agrarian party is of course the old landed aristocracy of Prussians known as the Junkers. Their influence in the State is considerable, but is thought by many to be declining. Yet they are a powerful class and must be reckoned with by party leaders. Herr von Miquel, the Prussian Minister of Finance and the leader of the National Liberal party, has secured their favor by a number of concessions, but it seemed probable in 1898 that they were expecting from him more than he was willing to grant. See AGRARIAN MOVEMENT.

The Germans at Kiao-Chau.—At the beginning of the year 1898 the most important subject of discussion was the German acquisition of the harbor of Kiao-Chau, in China. This was seized by a German naval force toward the close of 1897, and in January, 1898, it was announced that China had leased Kiao-Chau to Germany for ninety-nine years, permitting the latter power to construct a dock and a fortified coal-ing station at that point. See the article CHINA (paragraphs on History).

The June Elections.—On June 16, 1898, there was a general election of members of the *Reichstag*, that body having been dissolved by the Emperor with the hope that a more compliant majority might be found in the next. The result of the election showed losses for the Conservatives, National Liberals, South German Democrats, Poles and Anti-Semites; and gains for the Centre, the Advanced Radicals, the Han-overian Guelphs, the Alsatian party of protest and the Social Democrats. The Social Democrats gained eight seats in all, although they lost two seats to the Advanced Radicals in the election at the capital. From this account it will appear that the Kaiser was disappointed in his hopes of finding a more obedient Parliament. The balance of power continued to be held by the Clericals, who have begun to demand radical changes in favor of the Roman Catholic interest, and to insist anew upon principles which had been condemned by the Liberals during the *Kulturkampf*. An unusual feature of the campaign was the active part taken by women. Their indirect influence was very great and many of them, particularly in the Social Democratic party, went about persuading men not to fail in their duty toward their party. One significant result of the June elections was the defeat of the Agrarian League, of whom only four candidates were chosen to the *Reichstag*. The Agrarians do not constitute a separate party, but consist of members of several parties who incline to its characteristic views on the subject of a protective policy and the promotion of agriculture. (See the article AGRARIAN MOVEMENT.) The four members mentioned were independent representatives of the party, but in the *Reichstag* itself there were between 90 and 100 whose votes might be relied upon by the Agrarians.

Attitude Toward the United States.—The attitude of the German press toward the Spanish-American War occasioned some surprise in the United States. Its tone was distinctly unfriendly toward the United States, whose people saw with chagrin the evident dislike felt for them by the Germans. Not too much importance, however, was to be attached to these comments in the press, for the official attitude of Germany remained entirely neutral. Nevertheless, when to this hostile tone of public opinion was added the discourtesy of the German admiral at Manila, there was an emphatic expression of resentment in the newspapers of the United States. But the whole affair blew over, there being no sign that the German government was actuated by unfriendly motives. See article SPANISH-AMERICAN WAR and UNITED STATES (paragraphs on History).

The Emperor's Visit to the Holy Land.—In the autumn of 1898 the Emperor William started on a visit to the Holy Land. This had been talked of for a long time and there was much speculation in regard to the real object of the journey. The declared object of the Emperor's visit to Jerusalem was the consecration of an evangelical church, the Church of the Redeemer. The Emperor left Venice Oct. 13, and reached Constantinople Oct. 17. The original plan had been to pay first a visit to Egypt, but this was abandoned. After the Imperial party had left Venice the news came of the arrest of a large number of anarchists on the charge of a plot against the Emperor's life. According to the report it had been planned to assassinate the Emperor when he was passing through Cairo. At Constantinople every precaution was taken by the police. The Emperor reached Jerusalem on Oct. 29. The party was received with imposing ceremonies. After a visit to the Tower of David they went on foot to the Church of the Holy Sepulchre. The ceremony for which the Emperor had come, namely, the consecration of the Church of the Redeemer, was

performed with elaborate ceremonies on Oct. 30. There was a general feeling that the Emperor's visit to the Holy Land had an international significance, but just what this significance was could not be definitely made out from the mass of conjecture in regard to it. In the course of his tour he spoke frequently of Germany's intention and ability to protect German Christians wherever they might be. This, it was said, was a retort to the declaration of the Pope in a letter to the Archbishop of Rheims on Aug. 20, and in an address to the French pilgrims on Oct. 8, to the effect that the Catholics in the East were under the protectorate of France—a declaration which had caused offense in Germany. The pilgrimage was regarded with general approval in Germany, where it was thought that the object of the Emperor had been in the first place to maintain in the face of the diplomacy of the Vatican and of the French Republic Germany's right to protect German Catholics in the East and in the second place to open up German commerce with the East. One effect of his policy in the matter of the German Christians in the East was to unite the government with the party of the Centre, the latter having taken the national point of view and refused to allow itself to be influenced by the Pope. This result seems to promise an important effect upon the grouping of political parties in the *Reichstag*. It would seem in general that the friendship between Turkey and Germany was strengthened and that the interest of Germans has been renewed in the development of trade with Asia Minor. To some it seemed as if the ultimate result would be German ascendancy in the near East. Important commercial privileges were granted to Germany, including possession of a port and the right to construct a railway from Bagdad to the coast. It was also said that German capital would control the proposed railway between the sea of Marmora and the Persian gulf.

The Lippe-Detmold Affair.—Just before the Emperor started on his Eastern journey public interest in Germany was greatly aroused by an incident in connection with the question of succession to the principality of Lippe-Detmold. The accounts published in the English and American press in regard to this matter do not give a clear idea of its meaning or importance. As explained by a writer upon German politics, the main points appear to have been as follows: The last Prince of Lippe-Detmold having died without issue, there were conflicting claims to the succession. While these claims were pending, Prince Adolf of Schaumburg-Lippe, the Emperor's brother-in-law, was installed as Regent. At last the parties to the dispute agreed to submit the affair to the arbitration of the King of Saxony, who pronounced in favor of the Count of Lippe-Biesterfeld. The latter was accepted by the people of Detmold as Regent, but not as Prince. The Emperor's brother-in-law had to give up his position as Regent. This was against the wishes of the Emperor, who sent a telegram to his brother-in-law saying that the principality could never find a better Regent than him. A further slight was offered by the Emperor to the Count of Lippe-Biesterfeld on the occasion of a review in the suburbs of Lippe. The Emperor completely ignored the existence of the Regent, as well as of the troops of the principality. There were other signs of the personal hostility of the Emperor, and of these the most conspicuous consisted in withholding from the Count the military honors which were ordinarily rendered to members of his family. The Count thereupon ventured to address the Emperor personally, and to beseech him in respectful language to cause the general commanding the place to change his attitude toward the Regent. He received in return a sharp reply by telegraph. Thereupon the Regent brought a complaint against the Emperor before a competent court. The Emperor, on the other hand, in his character as King of Prussia, proposed that the Federal Council should declare itself competent to determine all contests relative to succession which might arise between the princes of the German Empire. The result of such a course on the part of the Council would have been in the first place to re-open the whole question of the Lippe-Detmold succession, and in the second place, to establish a precedent for the Emperor's exercise of the right of determining for himself the form of government which he favored. It did not seem probable that the Emperor's project would be adopted. The affair, so slight in its beginning and in some aspects so absurd, really presented very serious difficulties, and opened up questions of the greatest importance in regard to the future of the German political system. The growing jealousy of Prussia on the part of the minor states of the Empire led to considerable irritation among the princes who, in South Germany especially, are hostile to the spirit of militarism which Prussia represents. They denied the right of the Federal Council to decide on the succession claims in the different states.

Measures Before the Reichstag.—The new *Reichstag* assembled in December, 1898, but after a week's work adjourned for the holidays. Not much was accomplished beyond some rather vehement eloquence on the part of opposition members such as Herr Richter and Herr Bebel, who sharply arraigned the government's recent policy, especially the expulsions in northern Schleswig. The invectives of the opposition were not taken very seriously although they expressed the view of a considerable element in the population. It was recently said by a Berlin newspaper that the *Reichstag* was

"the only asylum left within the Empire for the unfettered word" and in affording an outlet for violent speech it seems to serve as a safety valve. Among the important measures which were awaiting action at the close of the year 1898 was the new military bill, for which a safe majority was expected. The peace footing of the German army had been increased six times since 1872, rising from 350,000 at that date to about 600,000. The additional expense involved in the proposed increase was placed at 132,778,000 marks, which was a non-recurrent appropriation and 27,388,000 marks, a regular appropriation. The law provided that from the first of October, 1899, the number of men with the colors should be gradually increased until in the year 1902 it should reach the figure of 502,506. And this effective should continue until March 31, 1904. It was also provided that the Federal States should have a separate military administration, contributing to the effective army in proportion to their population. This increase would bring the formations to the following figures in 1902: Infantry, 625 battalions; cavalry, 482 squadrons; field artillery, 574 battalions; artillery not mounted, 38 battalions; pioneers, 26 battalions; troops for the railway and telegraph, 11 battalions; train 23 battalions. Coming at a time when there seemed to be no especial danger of war either from national complications or from the increased armaments of neighboring states and with the Czar's peace proposal causing so much comment, this increase of the military effective occasioned some astonishment. The friends of the measure justified it by saying that while the Czar's pacific attitude showed that for the present war was not to be expected from that quarter, there was no sign that disarmament would take place and it was hardly to be hoped for. It was said that the vote for the increase of the peace effective was the price which the government asked for consenting to the law modifying the two years' service and that it would not maintain that law longer than the period during which the increase in the effective lasted. Another measure was for the increase of invalids' and veterans' pensions. A naval appropriation bill was also to be considered, but the time had not come for increasing the navy to the extent desired in some quarters, where it was urged that the German navy should at least be placed on an equally strong footing with the American. According to existing plans, the tonnage of the American navy in 1901 would be considerably in excess of the German. An economic measure of importance to Americans was the imperial meat inspection bill, which if favorably acted upon would, it was hoped, result in a more just attitude toward American meat than was shown under the existing legislation of the different German states, but in some quarters it was feared that the measure, while apparently showing no discrimination against Americans, would in effect operate prejudicially to them. The importation of American meat into Germany seems to have greatly increased. In 1896 it was estimated at 27,000,000 pounds, in 1897 at 53,000,000 pounds, and in the first ten months of 1898 at 80,000,000 pounds.

An important piece of work before the *Reichstag* was the settlement of the social question which threatened to precipitate a conflict between the government and the *Reichstag*. In a speech which he delivered in the summer of 1898 at a banquet at Veynhausen, the Emperor announced a measure for the protection of labor and those who wished to labor. It was to be aimed at all who tried to cause discontent among workingmen. These agitators were to be condemned to detention in a house of correction. The speech caused great irritation among the workingmen and Socialists, for it seemed to them that the project aimed to suppress freedom of association which was regarded as the chief element of their political and social independence. The official press tried to allay their apprehension by saying that the project had nothing to do with the right of association itself, but merely aimed to prevent the terrorism of workingmen who were disposed to work—such a terrorism as was often exercised during strikes. On the other hand it was urged that under existing laws such attempts when they went to the length of threats of violence were already punishable. There was therefore a tendency to suspect the Emperor of a more serious design. In his speech from the throne delivered at the opening of the *Reichstag* he announced a project of law tending to protect workingmen who desired to work but at the end of the year no action had been taken in regard to it.

Expulsion of Foreigners.—An important measure awaiting action in the Prussian Diet was the question of expelling Danes, Swedes, Norwegians, Russians and Austrians from the eastern border of Prussia. Much discussion took place on this policy during the year and a large portion of the German people as well as the press condemned it as barbarous. Considerable publicity was given to the arraignment of this policy by Professor Delbrück of the University of Berlin, who characterized it plainly as a system of persecution. By the government it was termed euphemistically a system of coercing "politically incommodious persons." See AUSTRIA-HUNGARY; also GERMAN LITERATURE, and ARCHÆOLOGY (paragraphs Switzerland and Germany).

GEYSERS. The distribution of geysers has been considered by Weed to be confined to areas of acid igneous rocks, and along natural drainage lines where mete-

oric waters accumulate for discharge, the source of the heat coming from escaping vapors or slowly cooling lavas, which have come to rest comparatively near the surface. Recent experiments to determine the causes of intermittent and constant discharge of geysers show, that they are boiling springs which are subject to the laws of hydrostatic pressure, in common with other springs. The geyser consists of a tube and reservoir, and the constant or intermittent action depends on the head in the latter, and also on whether the geyser has a continuous or intermittent off-flow. Those which are irregular in their action have continuously overflowing vents, while regular geysers have confined waters, and overflow only during eruption. In the former there is a continual inflow of cold water to the vent replacing that which runs off, and the ebullition necessary to produce eruption is prevented. If the water is confined and the heat supply constant, cold water rushes in only after each eruption, and a definite interval is required to bring the water at the base of the column to the boiling point. The change in head is produced by variations in the rainfall, the building up of a sinter cone around the geyser, or the forming of new outlets at lower levels.

GHIRLANDAIO, FRESCO, See PAINTING.

GIBBS, JOHN BLAIR, M. D., was killed in the fight at Guantanamo, Cuba, June 12, 1898. He was about fifty years old and was born in Richmond, Virginia. After his graduation from Rutgers College he entered the medical department of the University of Pennsylvania, and having taken his degree came to New York; built up a large and valuable practice there. After the outbreak of the war with Spain he was the first physician to be accepted from New York. He was assigned as assistant surgeon on the *Miantonomoh*.

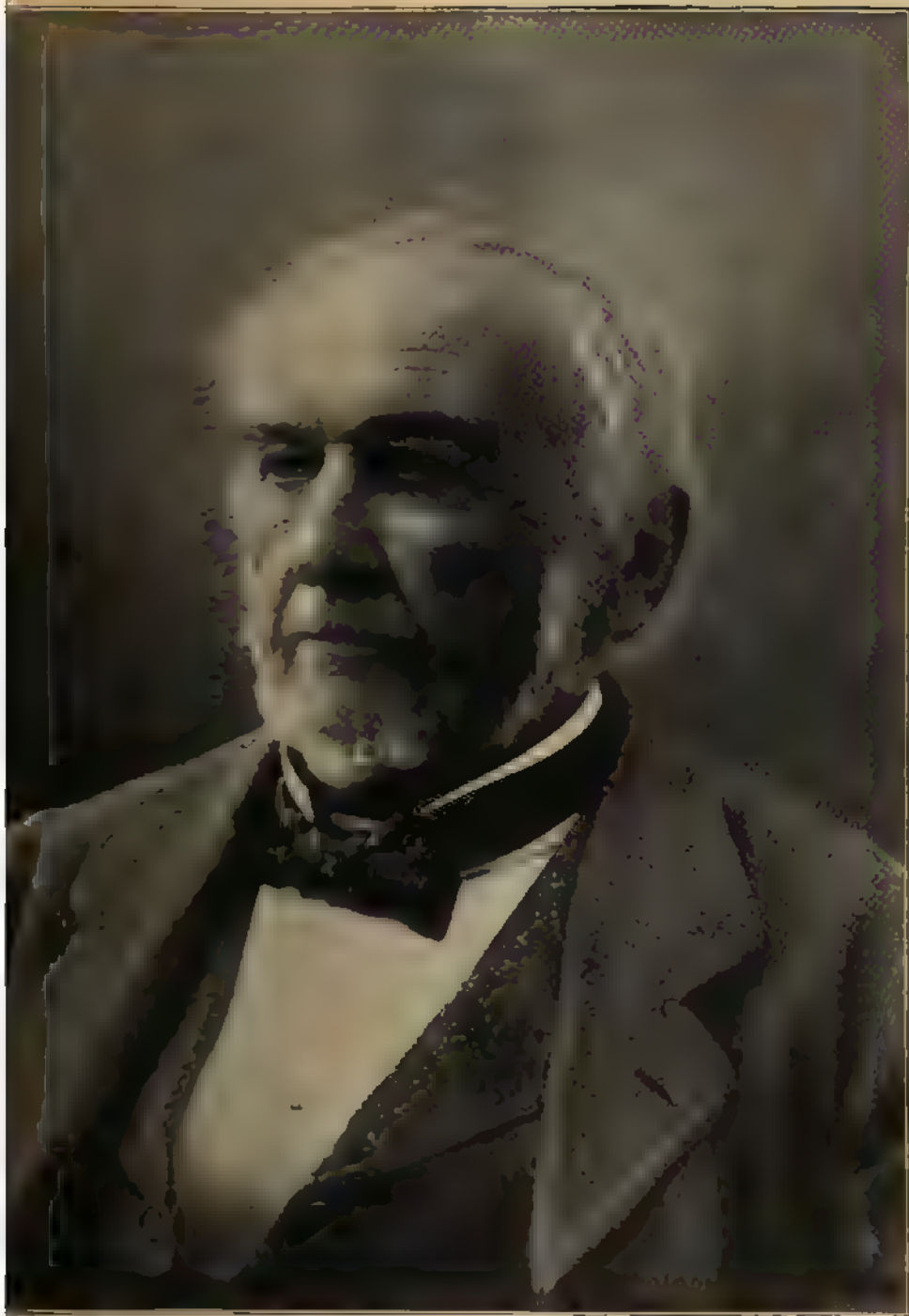
GILBERT, JASPER WILLET, died in Brooklyn, New York, February 10, 1898. He was born in Rome, New York, January 15, 1812; admitted to the bar in 1835; became the first corporation counsel of Rochester after its incorporation in 1839; from 1865 to 1883 was justice of the New York Supreme Court.

GILBERT, Sir JOHN THOMAS, LL. D., author of numerous works on Irish history, died in London, England, May 23, 1898. He was born in Dublin in 1829 and was educated in that city and in England. He was Secretary of the Public Record Office in Ireland, at Dublin, 1867-75. When member of the council of the Royal Irish Academy and its honorary librarian, he aroused much interest in Celtic studies by publishing some important manuscripts of the ancient Irish tongue. He was a member of the Senate of the Royal University of Ireland; Governor of the National Gallery, Ireland; Crown Trustee of the National Library of Ireland; Vice-President and Honorary Librarian of the Royal Irish Academy, Dublin; Honorary Professor of Archaeology in the Royal Academy of Fine Arts; held the gold medal of the Royal Irish Academy; was member of the Council of the Pipe Roll Society of London; and Honorary Fellow of the Royal Society of Antiquaries of Ireland. Dr. Gilbert's publications were as follows: *Historic Literature of Ireland*; *Facsimiles of National Manuscripts of Ireland*; *Calendar of Ancient Records of Dublin*; *History of the City of Dublin*; *History of the Viceroy's of Ireland (1172-1500)*, 1865; *Historical and Municipal Documents of Ireland (1172-1320)*, 1870; *History of Affairs in Ireland (1641-52)*, 1879-81; *History of the Irish Confederation and War in Ireland (1641-49)*, 1882-90; *Documents relating to Ireland (1795-1814)*, 1893; *Jacobite Narrative of War in Ireland (1688-91)*; *Narrative in Connection with Maria Clementia Stuart, styled Queen of Great Britain and Ireland (1795-1814)*. *Crede Mihi*; *Ancient Register of Archbishops of Dublin*; *Chartularies of Abbeys of St. Mary and St. Thomas, Dublin*.

GINGKO. See BOTANY (paragraphs Spermatozoids in Gymnasperms).

GLACIERS. H. F. Reid's work on the periodic variations of glaciers, shows that a general retreat is to be observed in the glaciers of Asia, Europe and the United States, while those of Greenland show a slight tendency to advance. The stratification observed in glaciers, he concludes may come from successive snow falls on the *névé*, and this banding is very persistent, but is to be distinguished from the transverse blue banding seen especially in the constricted or very steep part of glaciers, and which is analogous to cleavage, which is occasioned by pressure of the moving ice.

GLADSTONE, WILLIAM EWART, died on the 19th of May, 1898, at Hawarden Castle, whither he had come from Cannes, March 22. His disease was of a cancerous nature, affecting the face, especially the nose and eyes, and for nine months he had suffered intensely but with patience. The funeral services began Wednesday, May 25, when the coffin was borne early in the morning to Hawarden Church, which was opened to the public at eleven o'clock. Throngs from the country round about filled the church until half past five when there was a short private service, after which the funeral party proceeded to Broughton Hall Station and then by rail to



THE LATE WILLIAM EWART GLADSTONE.

From a new photograph by Numa Blum Fils, Cannes (France).

London. The same night the coffin, after being officially sealed, was taken into Westminster Hall, and the final arrangements were made for the morrow's lying in state. Beginning with Thursday morning immense crowds viewed the coffin for two days. The state funeral, which had been provided for by special act of Parliament, was held Saturday, May 28, at eleven in the morning. The funeral procession entered the Hall in the following order: The House of Commons, the House of Lords, Privy Councillors and representatives of royal personages, the bier, and relatives and friends of the deceased. The pall bearers were: the Prince of Wales and the Duke of York, representing the crown; the chiefs of both parties, Lord Salisbury and Lord Kimberley, Sir William Harcourt and Mr. Arthur James Balfour; and Mr. Gladstone's old friends, the Duke of Rutland, Lord Rosebery, Lord Rendle, and Mr. Armitstead. It is doubtful if the state ceremonies have ever been surpassed in dignity and impressiveness. The grave in the Abbey is between the monument of Admiral Sir Peter Warren and that of Earl of Mansfield, and Mr. Gladstone's statue is placed near that of his old leader, Sir Robert Peel, facing the statue of the Earl of Beaconsfield, who was the first stumbling-block to Peel as he was afterward the greatest opponent of Gladstone. Mr. Gladstone's titles, as announced at the funeral by the Norroy King of Arms, were as follows: "The Right Honorable William Ewart Gladstone, one of Her Majesty's most honorable Privy Councillors, sometime First Lord Commissioner of the Treasury, Lord Privy Seal, Chancellor and other Treasurers of the Exchequer, Her Majesty's Principal Secretary of State for the Colonies, President of the Board of Trade, and Lord High Commissioner Extraordinary for the Ionian Islands." Memorial services were held in various towns throughout England. All classes felt that the cause of humanity and righteous politics had lost a champion, and the profound hush which fell on both Great Britain and America, when his death became known, was significant of the people's love for Mr. Gladstone.

The final place that history will give to Mr. Gladstone cannot yet be definitely determined. While in general he has received almost unqualified eulogy, there were those who held that he was largely a creature of circumstance, one who, shrewdly drifting with the tide of popular feeling, was exceedingly overestimated, and that his wonderful versatility led the people to attribute to him a greatness that was not his. Great though he was as orator, essayist, scholar, theologian, parliamentarian, he had in each of these his superiors; and yet beyond all doubt there was no other man of his time who so magnificently combined the really great orator, essayist, scholar, theologian and parliamentarian. Throughout his long life Mr. Gladstone was famous as an orator. The power of his oratory lay in his own strong personality, his energy in delivery, and the clearness with which he presented his theme. Unlike Burke and Pitt, but few of his speeches will live as great specimens of oratory for in the magic of the spoken word lay his power. Though a prolific writer, he never achieved any considerable permanent success in literature because so much of what he wrote is nearly unreadable; for Disraeli's sarcastic remark about his "exuberance of verbosity" certainly contained some truth. We must not, however, overlook his real power. While scholars may disparage his classical studies, and philosophers his theological work, his writings on the relations of Church and State and on subjects of practical and theoretical politics, have a permanent value and interest. Mr. Gladstone's scholarship was of the old school, but profound, and his general knowledge was encyclopædic, embracing a vast number of unrelated subjects; in this he closely resembled, though he probably surpassed, Macaulay. He was a lover of art and of music, but a connoisseur of neither. Though Handel was a favorite with him, he usually preferred easy, simple melodies, and once in his old age, when speaking of the Welsh and their music, said, "their *Men of Harleck*, in my judgment, for the purpose of a national air, and without disparagement of *God Save the Queen*, or anything else, is the finest national air in the world." He was always an insatiable book collector and reader; "a book collector," he said, "ought as I conceive to possess the following qualifications: appetite, leisure, wealth, knowledge, discrimination, and perseverance. Of these I have only had two, the first and the last, and these are not the most important." In him was a peculiar combination of conservatism and the spirit of reform. He clung tenaciously to the past until he saw that old methods could no longer solve new problems; then with all the force of his nature he would espouse the new cause with the new method. So we see him during the early part of his career a Tory, during the latter part a Liberal, during all his life a loyal member of the English Church. He may be called "a Puritan High Churchman. He remembered, that is, so to be an Anglican as not to forget that he was a Protestant and an Englishman."

It is not our purpose to review the career of Mr. Gladstone, but to reflect somewhat the thought and expression relative to him subsequent to his death. Some Americans have felt that, because of his old statement concerning the army, the

navy, and the "nation" which Jefferson Davis "created," he was unfriendly to the United States. Though Gladstone was an apostle of freedom, he was not democratic as we are democratic; he was conservative, he was a lover of monarchy. And so it is probable that there are many things in American institutions and methods which he did not like; but it is safe to say he was the friend of America; he admitted his mistake concerning the confederacy; he realized our greatness and predicted our commercial supremacy. He said "there can hardly be a doubt, as between the America and the England of the future, that the daughter at no very distant time, will, whether fairer, or less fair, be unquestionably yet stronger than the mother." The trend of his thought and work—his desire for the advancement of the spirit of true civilization and culture—was toward a feeling of closer sympathy and kinship between the English and American peoples. In dealing with the *Alabama* claims in 1872, he insisted upon arbitration. The amount awarded to the United States, however,—about \$16,000,000—was always a humiliation to Mr. Gladstone, who justly prided himself on his financial shrewdness and ability.

He was a lover of peace, a supporter of the principle of arbitration, but was not blind to the fact that sometimes war becomes necessary. When he heard of the Bulgarian atrocities, he thought that the English admiral at that time in Besika bay "should inform the government of Constantinople that from that hour, until atonement had been made, until punishment had descended, until justice had been vindicated, not a man, nor a ship, nor a boat should cross the waters of the Bosphorus, or the cloudy Euxine, or the bright Ægean, to carry aid to the Turkish troops." At the time of the Armenian massacres, he would have had an English fleet sent to Constantinople summarily to end the barbarities. To large and permanent military establishments Mr. Gladstone was firmly opposed. Fifty years ago Sir Robert Peel, seeing the economic evils arising from standing armies, appealed to the European nations for disarmament; and Mr. Gladstone to the end of his life reiterated and augmented the mighty words of his early master. He also denounced the "imperial" policy of England as being usually both unwise and immoral; he tried to turn the attention of the government more to questions of land laws, reductions of public expenditure, Irish troubles, Indian finance, and national education. "The lust of territorial aggrandizement," he said, "is the original sin of nations."

His death reopened to some extent the discussions of the attitude of the British Government toward General Gordon in his Soudan expedition of 1884. It has been said that the tardiness of Mr. Gladstone in recognizing the need of General Gordon and in sending him assistance was the gravest error he ever committed. He received violent censure for this both at the time and during succeeding years. It seems improbable, however, that severe blame will finally rest upon Gladstone for the unfortunate affair. The Egyptian policy of the government was forced upon Mr. Gladstone and he was obliged to accept the responsibility of a situation which he himself would never have created. Mr. Justin McCarthy says that Gladstone was not responsible for Gordon's death and that the difficulty of getting troops to Khartoum was sufficient excuse for the government. There is no doubt that the public, fascinated by the striking personality of General Gordon, and aroused by the Coercion Acts, the Phoenix Park murders, the Egyptian policy and the bombardment of Alexandria, too readily blamed the Gladstone government. In January 1884, General Gordon returned to the Soudan, having received permission to do this in the absence of Mr. Gladstone. In the House of Commons, Mr. Gladstone himself stated the purpose of this expedition: "General Gordon went not for the purpose of conquering the Soudan, or to persuade the chiefs of the Soudan, the Sultans at the head of their troops, to submit themselves to the Egyptian Government. He went for the double purpose of evacuating the country by extricating the Egyptian garrisons, and reconstituting it by giving back to these Sultans their ancestral powers, withdrawn or superseded during the period of Egyptian occupation." General Gordon was to employ only pacific measures. He did this upon reaching the Soudan, but being unsuccessful he resorted to military means and from his movements it seemed to some observers that he even intended making himself a kind of Sultan of the region. It is stated that he could easily have retreated before he entrenched himself at Khartoum, indeed up to the time of the fall of Berber. Lord Granville said that in the latter part of January 1885, the government received cheerful messages from General Gordon, but on February 4th came the news of the fall of Khartoum.

The Home Rule Bill has been attributed by Mr. Bryce to Mr. Gladstone's intense perception of the unfairness and cruelty with which England had treated Ireland. He had faith in freedom as that which makes men better and more competent, and he "believed implicitly in the good instincts of the masses." His memory is honored not only as a great statesman, ruler, law-giver, but as a man who thought and worked for the elevation of men. As a statesman he doubtless did and said things that were unwise, but no one ever questioned the sincerity of this purpose

or his patriotism; he was a "practical politician" who had kept himself "unspotted from the world."

In the death of Mr. Gladstone the Liberal party suffered an irreparable loss; for although he had retired from public life four years previously, it was not until his last illness that the leaders ceased to ask and act upon his counsel; while the loss of his moral support and influence was greater than that of his direct political advice. And it may finally be said that, with due appreciation for his qualities of intellect, for his tireless persistence, for his powers of persuasion and command, no just conception of Mr. Gladstone can be attained that does not make the moral and spiritual element preëminent and dominating.

GOLD. Production.—The world's production of gold for the last two years, and for 1886 which it is of interest to give in order to show the greatly increased production of this metal, was:

1886.....	\$99,250,887.
1897.....	237,332,456.
1898.....	286,218,954.

The output of the different countries can be best seen from the following table, which is taken from the statistical number of the *Engineering and Mining Journal*.

COUNTRIES.	1897.		1898.	
	Fine ounces.	Value.	Fine ounces.	Value.
NORTH AMERICA:				
United States.....	2,774,985	\$50,210,795	2,110,788	\$84,800,000
Canada.....	259,487	6,190,000	684,509	14,180,000
Newfoundland.....	8,000	62,010	8,000	62,010
Mexico.....	244,488	7,121,188	265,082	7,683,885
Central America.....	25,599	535,000	25,599	535,000
SOUTH AMERICA:				
Argentina.....	15,285	314,907	15,285	314,907
Bolivia.....	3,144	65,000	3,144	65,000
Brazil.....	70,782	1,482,180	84,688	1,780,000
Chile.....	68,086	1,407,544	68,086	1,407,544
Colombia.....	188,679	3,900,000	188,679	3,900,000
Ecuador.....	6,480	132,900	6,480	132,900
Guiana (British).....	101,505	209,898	88,617	1,861,288
Guiana (Dutch).....	83,983	681,748	22,273	584,431
Guiana (French).....	59,859	1,237,310	60,528	1,378,477
Porto.....	5,787	119,628	5,787	119,628
Uruguay.....	5,880	114,800	6,880	114,800
Venezuela.....	82,384	814,087	82,384	814,087
EUROPE:				
Austria-Hungary.....	105,387	2,178,556	105,387	2,178,556
France.....	10,513	217,304	10,513	217,304
Germany.....	90,921	1,879,387	90,921	1,879,387
Italy.....	10,325	213,481	10,325	213,481
Norway.....	650	13,508	658	13,508
Russia.....	1,044,925	21,588,480	1,216,100	25,139,994
Sweden.....	3,702	76,584	3,702	76,584
Turkey.....	387	8,000	387	8,000
United Kingdom.....	2,082	42,001	2,082	42,001
ASIA:				
China.....	321,296	6,641,190	321,296	6,641,190
India (British).....	358,177	7,299,554	393,018	7,758,180
Japan.....	84,509	713,300	84,509	713,300
Korea.....	34,918	721,765	34,918	721,765
Malay Peninsula.....	25,000	516,750	25,000	516,750
Borneo.....	4,887	100,000	4,887	100,000
AFRICA:				
Witwatersrand.....	2,511,544	51,913,607	3,554,746	73,476,600
Other districts S. A. B.....	232,486	4,805,073	239,328	4,744,380
West Coast.....	24,276	501,798	24,276	501,798
Rhodesia.....			10,098	206,700
Madagascar.....	19,351	400,000	19,351	400,000
AUSTRALASIA:				
Seven colonies.....	2,580,388	52,095,388	2,945,436	61,490,763
Total.....	11,369,475	\$237,332,456	12,805,407	\$286,218,954

The great increase in production is due partly to the improved methods of mining and metallurgy, and the steady decrease in the cost of material. At the present

day ores running five dollars per ton, and sometimes even less are not uncommonly worked. In the United States Colorado, South Dakota, and Utah show the chief increase in production, while in foreign countries, great gains were shown in the Coolgardie, Witwatersrand, and Klondike districts. The first two probably represent an increased production of a permanent nature, but the third being placer deposits, may be only temporarily productive. The world's production of gold is obtained at present from twelve districts, *i. e.* the Witwatersrand, in South Africa, Coolgardie, and Kalgoorlie, in Western Australia; Ballarat, and Bendigo, in Victoria; Charter Towers, and Mt. Morgan, in Queensland; The Colar field of Mysore, in India; Cripple Creek in Colorado; Black Hills in South Dakota, Mother Lode in California and Douglass Island, and the Klondike in Alaska.

The United States Geological Survey has been making an examination of the gold resources of Alaska, and finds that the deposits consist of two kinds, *viz.* quartz veins and gravel deposits. The former have thus far been developed only in the coastal regions, where there are many mills for crushing the ore. The chief deposits lie in a belt about one hundred miles long reaching from Sundum on the southeast past Juneau, to Berner's bay, and a second belt is found further west in the vicinity of Sitka. The ores are not always rich but the excellent facilities permit cheap working. The veins are in metamorphic slates, diabases, and granites, similar to those of California, and are possibly of the same age, but farther north on Unga Island of the Shumagin Group they occur in Tertiary volcanic rocks, and as such rocks abound in the islands of that vicinity, this occurrence is of interest. In the interior of Alaska in the Yukon Region, gold has thus far only been found in gravel deposits, but it has probably been derived originally from a series of rocks known as the Birch creek and Forty Mile formations. The gravel deposits are found in gulches tributary to the Klondike river, above Dawson, and similar ones have been found along Indian creek and Stewart river, all of these lying in the line of strike of the gold-bearing rocks of the Forty Mile district. Of the Klondike tributaries, the southern ones such as the Bonanza, Eldorado, and Hunker Creeks have afforded the richest gravels. No gold in paying quantities has been found in the valley of the Klondike river itself. The famous Comstock Lode at Virginia City, Nev., which has passed through such a series of misfortunes, and whose lower workings were at one time abandoned owing to the enormous inflow of hot water, is to be reopened. The water is to be pumped out by means of a hydraulic elevator which will be used on a large scale; it will have a capacity of about 10,000 gallons per minute, and the work will be the largest yet undertaken by this type of machine.

Metallurgy.—The gold ores of Alaska, California, and South Dakota are treated chiefly in stamps and amalgamation mills, and the same process is used to some extent in Colorado. The chief method of extracting gold from its ores especially in Colorado, Utah, Montana, and in part California and Arizona as well as in portions of the southern Appalachian States are the cyanide and chlorination methods, and this leaching process of gold extraction is growing in favor, although metallurgists are not yet thoroughly agreed as to which of the two wet methods mentioned is the best. There are between 40 and 50 cyanide lixiviation works in operation in the United States at the present day, and a lesser number of chlorination ones. The processes have to be modified at different localities depending on the character of the ores, many of which have to be first roasted.

Literature.—J. F. Kemp contributes a valuable monograph on the occurrence of telluride gold ores, in the *Mineral Industry* for 1897, in which he shows that the occurrence of gold in this form is far more wide spread than was formerly supposed. The celebrated Cripple Creek ores, and many of the Black Hills deposits are of this nature.

Other recent publications of importance are *The Gold Fields of Australasia* by Schmeisser and Vogelsang, *The Witwatersrand Gold fields* by S. J. Truscott, and *L'Or dans le Nature* by Caneng and Robellaz. The aim of the last named work is to present in condensed form the latest information concerning the occurrence of gold in nature and its geographical distribution.

GOLD AND SILVER, MELTING POINTS OF. D. Bertholet gives us the latest figures on the melting points of these two metals. These were determined by means of the thermoelectric couple of platinum and platino-iridium. The values obtained for silver were between 959.2 and 966.2 C. with a mean of 962 C. while those for gold varied between 1,062.1 and 1,066.7 with a mean of 1,064 C.

GOLD COAST, one of the West African colonies of Great Britain, stretches along the coast of the Gulf of Guinea for some 350 miles and extends into the interior for about 300 miles. It has an area of about 15,000 square miles for the settlement proper and of about 46,600 square miles including the protectorate. Its estimated population is 1,500,000 of whom 150 are Europeans and its chief towns are

Accra (16,267), Elmina (10,530), and Cape Coast Castle (11,614). Its exports include gold, ivory, copal, palm oil, palm kernels, and India rubber. There is also an increasing trade in native woods. The revenue and commerce have increased considerably since 1892. Over 500 miles of railway have been built. It is administered by a governor with an executive and legislative council nominated. The colony was founded by a chartered company which, in 1821, transferred it to the crown. It has been a separate colony since 1874. It includes in its sphere of influence the protectorate Ashanti which was established as a result of the expedition of 1895-6 to the Ashanti capital, Kumasi. The king made a formal submission to the British authorities and there has since been a British Resident at his capital. The hinterland of the Gold Coast has recently been the subject of conflicting claims on the part of France and Great Britain, but in 1898 the Anglo-French commission which sat at Paris determined the boundary. See NIGER TERRITORIES.

GOLDEN CHAIN, ORDER OF, a fraternal society founded in 1881 has now 182 subordinate lodges, and 8,450 members, with headquarters in Baltimore, Md. Since 1881 it has disbursed \$1,895,640 and \$257,360 during its last fiscal year. Commander, Joseph A. Baden; Supreme Secretary, A. S. Wier.

GOLDSCHMIDT, JULIUS, United States consul-general at Berlin, died in that city, November 2, 1898. He was born in Osterode, Hanover, in 1847; came to the United States in 1867 and engaged in business in Milwaukee, Wisconsin. In that city he became a member of the Board of Trade, the Board of Education, and the Public Library Board. He served as consul-general at Vienna during the administration of President Harrison and in 1897 was appointed consul-general at Berlin.

GOLF IN THE UNITED STATES. Golf continues to increase in popularity in this country. While the use and care of the large tracts of land which the game demands still put private clubs beyond the means of many, large cities like New York and Boston are doing something to increase the number of golfers by providing free public links. Of private clubs there is a constant and rapid increase all over the country. On May 5, at Ardsley, Yale defeated Harvard and won for the second consecutive time the Intercollegiate Golf championship. The open golf championship of the United States was won at Hamilton, Massachusetts, June 18, by Frederick Herd, of the Washington Park Golf Club, Chicago, Ill., and lately of the Ancient and Royal Golf Club of St. Andrew's, Scotland. The play for the amateur golf championship at Morristown, N. J., during the week of September 19, resulted in the victory of Mr. Findlay Douglas, a graduate of St. Andrew's University, and of the St. Andrew's links, in Scotland. At Ardsley, Oct. 16, Miss Beatrix Hoyt defeated Miss Maude K. Wetmore. This is the third time that Miss Hoyt has won the woman's golf championship.

GOMEZ, MAXIMO, commander-in-chief of the Cuban army, was born of Spanish parentage in Bani, San Domingo, in 1838. Having entered the Spanish army he served in the island of Haiti. After San Domingo gained its freedom, he went with the Spanish troops to Cuba, and while at Santiago became disgusted with the cruelty and official dishonesty of the Spanish general, Villar, upon whom he made a personal assault, withdrawing thereupon from the Spanish service. He settled down as a planter, but on the outbreak of the Ten Years' war in 1868 he joined the insurgents and received a command from the Cuban president, Cespides. Together with the latter and General Agramonte, Gomez captured Bayamo, Juguani, Tunas, and Holguin. He also captured Nuevitas, Guaimaro, Santa Cruz, and Cascorro, and participated in the battles of Las Guasimas and Palo Sico. Subsequently Gomez invaded Santa Clara and defeated General Jovellar, being promoted at this time to the rank of major-general; upon the death of General Agramonte, Gomez succeeded him as commander-in-chief. In 1878 the Spanish governor-general, Martinez Campos, persuaded the Cuban leaders to accept terms of peace, whereupon Gomez retired to Jamaica and later went to San Domingo. He was engaged there in agriculture until sent for by the Cuban revolutionary president, Marti, at the outbreak of the second revolution of 1895. Then were planned the hostilities which did not end until the American victories over the Spaniards in 1898. Of the Cuban leaders in the rebellion the most prominent were Gomez, Antonio Maceo, and Calixto Garcia (q.v.).

GOODENOUGH, Lieutenant-General SIR WILLIAM HOWLEY, K. C. B., died Oct. 24, 1898. He was in supreme command of the British troops in South Africa, having his residence at Cape Town. He was born April 5, 1833; educated at Westminster; became second lieutenant Royal Artillery in December 1849. Promotion came and in the course of his career he held many high positions, including brigadier-general commanding the Royal Artillery of the expeditionary force in Egypt, 1882, and inspector-general of artillery, 1886-89. He served in the Indian Mutiny, 1857-58, and was severely wounded at Birwa; his gallantry was noted in the dispatches and won for him a medal and clasp. He was similarly honored for his conduct in the Egyptian cam-

paign of 1882 and was also made a C. B. In May 1891, he was appointed lieutenant-general of the Royal Artillery, and in 1897 became a K. C. B. He was joint author with Lieutenant-Colonel J. C. Dalton, R. A., of *The Army Book for the British Empire*. He married Countess Kinsky.

GOOD FELLOWS, ROYAL SOCIETY OF, a fraternal society founded in 1882, has now four grand assemblies, 202 subordinate assemblies, and 10,387 members. \$3,470,950 has been disbursed since its organization, and \$324,369 during the last fiscal year. Premier, J. H. McGregor, Montague, Me.; Secretary, J. W. Swoger, Boston, Mass.

GOOD TEMPLARS, INDEPENDENT ORDER OF, see INDEPENDENT ORDER OF GOOD TEMPLARS.

GORDON, WILLIAM W., Brigadier-General, U. S. Volunteers, a well-known citizen of Georgia, who at the outbreak of the Spanish-American War received his appointment of brigadier-general, being at that time colonel of the Savannah National Guard regiment. He served in the Civil War. On August 16, 1898, he was appointed by President McKinley a member of the commission to arrange for the evacuation of Porto Rico by the Spaniards.

GRAND ARMY OF THE REPUBLIC. The first post was organized at Decatur, Ill., April 6, 1866, and the first National Encampment was held in Indianapolis, Nov. 20, 1866. Commander-in-chief, James A. Saxton, Chicago. There are 45 Departments each being represented by a number in the National Council of Administration. The number of army posts in June 1898, was 7,213, and the total number or members 318,475. The last Encampment was held in Cincinnati 1898.

GRAND UNITED ORDER OF ODD FELLOWS OF AMERICA, composed of colored Odd Fellows, had in 1897, 2,281 lodges, and 155,537 members. Its property amounted to \$1,867,597. Grand Master, E. H. Morris, Chicago, Ill.

GRANGE, NATIONAL. See NATIONAL GRANGE.

GRANITE. See BUILDING STONES.

GRAPHITE. The production of graphite, during 1898, was 1,400,000 lbs. which, compared with the production of 993,138 lbs., in 1897, shows a gratifying increase. The only American locality supplying a high grade graphite continues to be Ticonderoga, N. Y., although good deposits have been reported from near Wheatland, Wyoming. An important event during the past year was the manufacture of an artificial graphite from coke, and which it is claimed can be sold at the same price as the natural product. Some amorphous graphite was mined in Rhode Island during 1898.

GRATING FOR SPECTRUM. See PHYSICS.

GRAVITATION-GRAVITY. See PHYSICS (paragraph Gravitation Constant).

GRAY, GEORGE, Democratic United States Senator from Delaware, was appointed by President McKinley August 26, 1898, one of the commission of five to negotiate a treaty of peace with Spain. He was born at New Castle, Delaware, May 4, 1840; was graduated at Princeton, 1859, and in 1862 received his A. M.; studied at Harvard Law School, and was admitted to the bar in 1863; was appointed Attorney-General of Delaware in 1879 by Governor Hall and again in 1884 by Governor Stockley. Mr. Gray was a delegate to the national Democratic conventions of 1876, 1880, and 1884; was elected to the Federal Senate in 1885 to succeed Thomas F. Bayard, who had resigned to become Secretary of State; was reelected in 1887 and in 1893. Mr. Gray has been a supporter of tariff and civil service reform and of sound money. Previous to his appointment to the Peace Commission, he was a member of the Anglo-American Joint High Commission.

GREAT BRITAIN and the BRITISH EMPIRE. The area of the United Kingdom of Great Britain and Ireland is 120,979 sq. m., with a population in 1891 of 38,740,180. The estimates of area and population for the colonies and other possessions vary, but according to recent reports are in round numbers, 11,250,000 sq. m. and 344,000,000 inhabitants. As to the number of British, it was placed at 39,500,000 in 1897, with 10,500,000 in the colonies, making a total of 50,000,000. Details in regard to the various possessions of Great Britain will be found in the separate articles on the British colonies, protectorates and dependencies. The following table compiled by the United States government in 1898 gives a list of these, together with their area and population:

India:	Area.	
	Sq. miles.	Population.
British India	1,068,314	221,172,952
Feudatory states	731,944	66,050,479
Total India	1,800,258	287,223,431

COLONIES.		Area. Sq. miles.	Population.
Europe :			
Gibraltar		2	20,658
Malta and Gozo		119	176,231
Total Europe		121	196,889
Asia :			
Aden and Perim		80	41,910
Ceylon		25,365	3,008,466
Hong-kong		30	261,258
Labuan		30	5,853
Straits Settlements		1,472	558,935
Total Asia		26,977	3,876,422
Africa :			
Ascension		35	140
Basutoland		10,293	250,000
Cape Colony		292,000	1,821,550
Mauritius		705	374,940
Natal		32,900	778,000
St. Helena		47	3,890
West African colonies :			
Gambia		2,700	13,100
Gold coast		40,000	1,474,000
Lagos		1,071	85,000
Sierra Leone		15,000	74,900
Total Africa		394,760	4,875,520
America :			
Bermudas		20	15,950
Canada		3,315,647	4,833,300
Falkland Islands and South Georgia		7,500	1,950
British Guiana		109,000	278,260
British Honduras		7,562	33,800
Newfoundland and Labrador		162,200	208,000
West Indies :			
Bahamas		4,466	52,000
Jamaica and Turks Island		4,424	708,600
Barbados		166	189,000
Leeward Islands		701	127,800
Windward Islands		784	173,000
Trinidad and Tobago		1,868	261,300
Total America		3,614,338	6,882,960
Australasia :			
Fiji		7,740	120,500
New Guinea		88,460	350,000
New South Wales		310,367	1,297,900
New Zealand		104,471	714,200
Queensland		668,497	472,200
South Australia		903,690	360,200
Tasmania		26,215	166,100
Victoria		88,198	1,174,900
Western Australia		975,920	137,900
Total Australasia		3,173,558	4,793,900
Total colonies		7,209,754	20,625,691
Total India and colonies		9,010,012	307,849,122

PROTECTORATES AND SPHERES OF INFLUENCE.	Area. Sq. miles.	Population.
In Asia	120,400	1,200,000
In Africa	2,120,000	35,000,000
In the Pacific .....	.....	10,000
Total protectorates, etc.	2,240,000	36,210,000
Total India, colonies, protectorates, etc.	11,250,412	344,069,122

Mineral Products of the United Kingdom.—The principal minerals obtained from the United Kingdom are coal, iron ore, clays, sandstone, slates, limestone, salt, oil, shale, granite, whinstone, lead ore, tin ore, chalk, zinc ore, etc. These are given in the order of their importance as to the value of output in 1896, the estimate of value in the case of the metallic minerals being based on the values of the metals made from the ores. Of the non-metallic minerals coal is by far the most important. In 1896 the total amount of coal produced throughout the United Kingdom was 195,361,260 tons, of which the greater part was produced in England alone, the principal coal fields being in Durham, Yorkshire, Lancashire, Staffordshire and Derbyshire in England; in Glamorgan in Wales; and in Lanarkshire in Scotland. In 1896 there were 13,700,764 tons of iron ore produced in the United Kingdom, the value being £3,150,420. In the same year there were 373 blast furnaces and 21,204,284 tons of ore smelted. Despite the large home production of iron ore there were imported 5,438,307 tons with a value of £3,778,789. Among the minor minerals may be mentioned copper, lead, tin and zinc and of the non-metallic minerals the most important are, besides coal, various clays, sandstone, slates, limestone, salt, etc.

Agriculture.—Of the productive area of Great Britain and Ireland the largest acreage is taken up by permanent pasture, the next by the grain crops and the next by clover and grasses and green crops. In 1897 Great Britain had 7,457,061 acres in grain crops, 4,853,808 acres in clover and mature grasses, 3,189,508 acres in green crops, and 16,512,868 acres in permanent pasture. The production of wheat in Great Britain in 1897 was 54,913,000 bushels; barley 66,804,000 bushels; and oats 116,812,000 bushels, the last named being the only one of the three crops which showed an increase over the previous year. The wheat covered 1,889,161 acres; barley 2,035,790 acres; oats 3,036,056; turnips and swedes 1,833,145; and potatoes 504,914 acres. See IRELAND.

Manufactures.—Accurate statistics for the British manufactures during the year 1898 were not procurable. In respect to the numbers employed, the textile industries are the most important. A recent estimate places the number of people who are dependent upon the cotton, woolen and linen industries of Great Britain and Ireland at five million, and the capital invested at £200,000,000. The figures given in the following paragraphs on commerce afford an index to the industrial activity of the United Kingdom. See also COTTON and the COTTON INDUSTRY.

Commerce.—Great Britain is the leading commercial nation of the world. A comparison between the foreign trade of the United Kingdom in 1896 and that in 1897 is afforded by the following statistics: In 1896: total imports £441,808,904; exports of British products £240,145,551; exports of foreign and colonial products £56,233,663; total imports and exports £738,118,118. In 1897: total imports £451,238,683; exports of British products £234,350,003; exports of foreign and colonial products £59,833,677; total imports and exports £745,422,363. Of the total trade of Great Britain and Ireland over 90 per cent. falls to England and Wales. Commercial statistics for the years 1895-96 show that of Great Britain's trade with foreign countries, the chief sharers in respect to the imports into the United Kingdom were, in the order of their importance, the United States, France, the Netherlands, Germany, and Russia. The imports of merchandise from the United States increased from £86,548,860 in 1895 to £106,347,349 in 1896. As a purchaser of the manufactures and other products of the United Kingdom, Germany led all the other nations, and next came the United States and France. The exports of all products of the United Kingdom to Germany increased from £20,586,310 to £22,244,405 in 1896, while those to the United States decreased from £27,948,553 in 1895 to £20,424,225 in 1896. The articles most largely imported into the United Kingdom are food stuffs, the chief being cereals and flour. In 1897 out of a total of £451,238,683 imports, £151,550,115 consisted of articles of food and drink duty free, and £26,791,519 of articles of food and drink dutiable; £70,263,511 of raw materials for textile manufactures; £85,038,387 of manufactured articles; £52,085,336 of raw materials for other industries than the textile; and £21,265,363 of metals. The most important items in the exports of the United Kingdom are yarns and textile fabrics, which amounted to £96,618,472 in 1897, out of a total export of British products of £234,350,003. The United Kingdom imports most of her wheat from foreign countries and of these the United States sends the largest supply. As to the conditions prevailing in the trade in other commodities the following facts may

be of interest: It is estimated that less than a third of the butter consumed in the United Kingdom is produced at home. The United Kingdom exports a considerable amount of coal, the largest purchaser being France. Lately there has been an increase in the exports to Sweden and Norway. There were signs of depression in the cotton trade as a whole in the year 1898, owing to the doubtful outlook in international politics, but large quantities of cotton yarn and twist were exported in 1898, showing an improvement over the previous years. As to the exportation of hardware and cutlery there was a decline during the first ten months of 1898 as compared with the same period during the previous year, the demand of the United States especially having fallen off. There was also a decline in the shipments of pig iron and of railway material, and in the case of tin plates, for which the demand on the part of the United States showed a marked falling off. The exportation of jute manufactures showed an increase, and that of yarns remained about the same as in 1897, while linen piece goods showed a falling off. The ship-building industries seemed to be in a favorable condition and the output for the first nine months of the year 1898 was considerably larger than that during the same period of the previous year. The imports of timber, which were unusually large during 1897, declined somewhat in 1898. The exports of woolen yarn showed a slight decline during the first ten months of 1898, as compared with that period during the previous year, while worsted yarn slightly improved. The exportation of woolen piece goods considerably declined, especially in the case of the United States, which is said to have taken only about one-sixth of the amount sold there in 1897. The same was true of worsted piece goods, of which the shipments to the United States were about one-fourth of what they had been in 1897.

Great Britain's Foreign Trade Policy.—How far the present agricultural condition of Great Britain is due to her foreign trade policy is a question very earnestly discussed by economic writers. It is certain that the agricultural resources of the country as at present developed are wholly inadequate to the sustenance of its population. Having less than two million acres under wheat and with an average annual crop of sixty million bushels, Great Britain depends upon foreign countries for some two hundred million bushels of this staple and similar conditions prevail in respect to the other means of subsistence. Some attribute this largely to the reversal of the English foreign trade policy in 1846, and the subsequent introduction of free trade. Since that time the British government has devoted itself to the promotion of foreign commerce. In this work the Foreign Office has shown great energy. The principle of its policy has been the maintenance and encouragement of British trade abroad and especially the protection and preservation of British colonies and dependencies. Foreign commerce is to some extent the concern of all the chief departments, including beside the Foreign Office, the Board of Trade, the Colonial Office, the Indian Office and the Treasury, the work being divided among them, and there being no separate government department of foreign commerce. The statistical department is the Board of Trade, which publishes monthly and annual reports of trade and navigation. The consular service has not been utilized for the promotion of trade to the extent that it has in the United States, but in 1898 a committee, which had been appointed to consider a plan for supplying to the home trades the information furnished by consuls, commercial attachés and agents-general, reported in favor of the establishment of a commercial intelligence office by the government. There are signs of a demand that the government shall take a more active part in furthering foreign commerce. Hitherto it has confined its efforts to making that trade as free and as safe as possible. This need of a more practical interference has followed as a result of the competition with Germany and the United States, whose growing importance has caused concern in Great Britain. An English commercial attaché in Germany remarked in a recent report, that if Great Britain wished to retain her position as the greatest commercial nation in the world she would have a hard fight before her; that her overwhelming supremacy commercially and industrially was not the assured fact it once had been. A recent United States Consular Report makes the following statement in regard to the British foreign trade: "The foreign trade of the United Kingdom reached highwater mark in that year of world-wide activity 1890, the figures being \$3,645,000,000, of which \$1,282,300,000 was represented by British products and manufactures exported, an excess of \$75,000,000, over any previous year. In the following year of depression, figures fell much below this great total. They recovered in 1896 to \$3,591,500,000, but exports of British produce and manufactures did not recover in proportion, amounting to \$1,167,000,000. In 1897 the net decrease in exports as compared with the previous year was about \$28,000,000, there being in the export of yarns and textile fabrics alone the striking decrease of \$40,000,000, to some extent no doubt accounted for by the new United States tariff. In April, 1898, as compared with April, 1897, the falling off in exports exceeded \$10,000,000, and the first four months of this year as compared with the corresponding period of last year showed a decrease of nearly \$19,000,000." Yet during this same period the exports of continental countries increased at a high rate. Between 1885

and 1894 the exports from the leading nations of the continent are said to have increased at the following rates: The Netherlands, $24\frac{3}{4}$ per cent.; Russia, 27 per cent.; Austria-Hungary, 18 per cent.; Germany, $31\frac{1}{2}$ per cent.; Denmark, 67 per cent.; Belgium, $8\frac{1}{2}$ per cent.; Italy, 8 per cent., (including silver bullion); Norway, 26 per cent. So far as the increase of domestic products exported is concerned the United Kingdom showed a rate below any of these countries, being only $1\frac{1}{4}$ per cent. While the comparatively small rate of increase showed by Germany does not seem to justify the fear felt in England of German competition, it should be noted that German trade with the East has advanced rapidly and usurped much that was formerly British. In Great Britain the success of Germany is attributed first, to the direct aid afforded by the government as in the granting of bounties and subsidies, in the second place to the superiority of her agents and their adaptability to the customs prevailing in foreign markets, and in the third place to the credit system of Germany. A fact which is frequently remarked in Great Britain is that Germany's chief article of export is woollen goods, next sugar and third cotton goods, thus showing a power to compete with England in the latter's own commodities, and Germany sells these products in England's colonies. Another competitor feared by Great Britain is the United States, which has been working its way into European markets with its iron and steel products, selling them at prices with which German and British producers have been unable to compete. It is these considerations that have led to the protective movement in Great Britain, a movement which aims at an imperial customs union which shall protect the entire British Empire against the rest of the world. But since it is estimated that over two-thirds of Great Britain's over-sea trade is with foreign colonies and one-third with her own colonies, it is thought that the fiscal results of this policy would not be all that are expected by its advocates. Another adverse argument is that such a customs union would oblige Great Britain to establish a tariff upon food products in the interest of her colonies and this would seriously affect the cost of production of her manufactures, for it is estimated for instance, that from the United States alone England imported over \$500,000,000 worth of commodities in 1896, most of them being food products. It would seem that Great Britain cannot meet the demands of her colonies without sacrificing a part of her foreign trade. Thus, in order to take advantage of the preferential tariff rates offered by Canada, England had to denounce treaties with Belgium and Germany on account of the stipulation in each of their treaties that Belgian and German goods should be subject to no higher duties in the British colonies than those imposed upon the goods coming from the mother country. These treaties expired at the close of July, 1898.

Colonial Trade.—When Mr. Joseph Chamberlain became Colonial Secretary he addressed to all the colonial governors a series of questions designed to show the extent to which foreign competition had made headway during the ten years ending with 1894. The replies received brought out the fact that the most formidable rivals of British trade were the United States and Germany; that in some branches of industry Belgium was a powerful rival and that in the East the competition of Japan was assuming importance. The reason assigned for the displacement of British-made goods was cheapness. Many of the colonies reported that in the first place several classes of articles were better packed and more attractive in appearance than those sent from Great Britain and that in the second place the agents of foreign countries were more energetic. The British government has been taking great pains to promote the trade of British merchants with the colonies, especially since this inquiry into the conditions of the colonial trade was made.

The Government's Efforts to Promote Trade.—The British government makes payments to steamship lines for carrying the mails. The extent of some of these subsidies is indicated in the United States Consular Reports as follows: The Australian service via the Suez Canal costs the government each year about \$436,000; the service to India and China about \$800,000; the New York service about \$420,000; the Canadian-Chinese service \$200,000. These figures show the net loss to the government after deducting the contributions from the colonies and the amount received for postage. Another means adopted by the government for promoting trade is in the contribution of money to technical education. It distributes these funds among the local authorities and attains but a slight control over their expenditure. It is estimated that the government of the United Kingdom annually expends over \$4,000,000 for this purpose. Apparently the funds thus distributed do not secure as good results as where they are directed by a centralized system such as prevails in Germany. They appear to be too widely diffused and are not always applied where they are most needed. The work of technical education however derives some support from the Trade Guilds of London which expend a portion of their revenues for this purpose and in that city technical instruction may be had in a great variety of industrial arts.

Education.—Higher education in Great Britain and Ireland is provided for by a number of universities and colleges, which in 1897 had 1,582 on the teaching staff

and 33,559 students in attendance. An important event in the history of universities during the year was the passage of the Act of Parliament (August 12, 1898) providing for the constitution of the University of London as a teaching as well as an examining body. Secondary education in England and Ireland is unorganized and is largely in the hands of private persons. In Scotland the school boards administer the burgh schools. Statistics in regard to secondary education are imperfect. As to elementary education it was reported that on August 31, 1897, there were 19,958 elementary schools inspected in England and Wales with accommodation for 6,215,199. On December 31, 1897, there were 9,057 elementary schools reported on the rolls in Ireland and of these 8,631 were in operation. The number of pupils on the rolls was 816,000, with an average attendance of 521,141. In Scotland in 1897 there were 3,086 primary schools, with accommodations for 843,769 scholars. In 1894 a royal commission was appointed to inquire into the subject of secondary education. In its report it favored the creation of a department of the executive government in charge of education and the creation of local authority in each county and county burgh with a population of more than 50,000. In July, 1898, an important conference was held on the subject of commercial education at the Guildhall in London for the purpose of discussing means of promoting the study of commercial subjects. On August 1 the Duke of Devonshire presented to Parliament a bill to provide for the establishment of a board of education for England and Wales with a view to centralizing the control of education by uniting the education department and the science and art department under the charge of a permanent secretary. There was much discussion of the relation of the government to education during the year. In the course of a debate in Parliament, Sir William Harcourt declared that the English system of national education was wholly inefficient. Sir John Gorst complained of the early age at which children left school, their irregularity of attendance and the inferiority of the voluntary schools to the board schools. But in spite of the agitation of the subject very little was effected toward the introduction of reforms.

Army.—On January 1, 1898, the distribution of all ranks of the British army was as follows: At home, 99,258; in Egypt, 5,553; in the colonies, 35,003; in India, 74,623. The reserves consist of the following classes: the militia; the yeomanry cavalry; the volunteer corps; and the army reserve force. Including these, the effectives at the beginning of 1898 numbered 665,344. The military estimates for 1898-9 provided for a progressive increase. When this programme is carried out there will be an addition of 16,059 to the regular army, which with the progressive increase provided for in the estimates of 1897-9, will bring the total increase to 25,083. In the Salisbury manœuvres held in 1898 a larger body of troops was engaged than ever before, including 53,600 men.

Navy.—At the beginning of 1898 there were 58 battleships and 8 building; 14 coast defence ships; 89 cruisers and 22 building; 19 look-out ships; 34 torpedo gun boats; 171 torpedo craft and 13 building. This is according to the classification followed by *The Statesman's Year Book*. The following list, taken from *The Statesman's Year Book*, shows the distribution of the vessels in February, 1898:

Mediterranean and Red Sea.....	41
Channel Squadron	15
North America and West Indies.....	15
East Indies	12
China	29
Cape of Good Hope and West Africa.....	16
Pacific	10
Australia	16
South-east coast of America.....	4
Particular Service	12
Surveying Service	7
Training Squadron	4
Total	181

In 1898 Parliament provided for an increase of the fleet by the construction of 7 battleships; 8 armored cruisers; and 12 destroyers.

Finances.—On April 21, Sir Michael Hicks-Beach presented his budget statement. Its showing was very favorable. During the year ending March 31, 1898, there had been an expenditure of £115,089,000, but there remained a surplus of £3,678,000. The increase over the preceding year was chiefly to be found in the customs and excise which afforded a good index to the prosperity of the year. Next in importance among the sources of revenue which yielded an increase, were the death duties and stamp duties, the income taxes and the post and telegraphs. This statement made a profound impression throughout the world as showing the sound and vigorous condition of English finances. For the next year, that is the year ending March 31, 1899

the Chancellor of the Exchequer estimated the receipts at the present rate of taxation to be £108,615,000, while the estimated expenditures fell short of this to the extent of £1,786,000. The existence of this surplus together with the surplus for the year ending March 31, 1898, led the government to propose a deduction of taxation chiefly on tobacco. Another reduction was proposed by a rearrangement of the income tax in such a way that it would bear less severely on persons with an income of from £400 to £700.

It may be of interest here to mention the main sources of revenue and the main items of expenditure in the British budget in reference to their relative importance. The chief source of imperial revenue is taxation which includes seven classes, namely, customs, excise, estate, etc., duties, stamps, the land tax, the house duty, and the income and property tax. From these seven sources 83 per cent. of the entire revenue was derived in the year ending March 31, 1897, and in the budget of the next year and the budget estimate for the year ending March 31, 1899, these classes continue to hold about the same relative importance. Of these seven sources of revenue the most productive has been the excise including the levies on spirits, beer and railways, and license duties. Next in the order of importance have been the customs, the taxable imports being tobacco, which is the most important of all, tea, rum, brandy, other spirits, wine, currants, coffee, raisins, and some other articles, of minor importance. Third in order of importance has been the income and property tax; fourth, the estate, etc., duties, and fifth, stamps. The other sources of revenue are classed under the heads of post-office, telegraph service, crown lands, interest on Suez Canal shares, and miscellaneous. Among the branches of expenditure the most important classes are the national debt services, other consolidated fund services, the army and navy, civil service, customs, and inland revenue services, post-office, telegraph services, and packet services. In the year ending March 31, 1897, the total revenue was £103,949,884, the total expenditures £101,476,669, leaving a surplus on March 31, 1897, of £2,473,215.

Labor Interests.—For some account of the great strikes in the engineering trade and the South Wales coal trade, see the article STRIKES and LOCKOUTS, and for a brief report of the trade union congress at Bristol, see the article TRADE UNIONS, CONGRESS OF. Other important labor congresses held during the year were the Irish Trades Union Congress at Belfast and the annual conference of the Independent Labor party at Birmingham. At the former the factory acts, child labor, the encouragement of home manufactures, the providing of work for the unemployed, the federation of trades unions, the settlement of labor disputes, were among the important topics discussed. The congress lasted from May 30 to June 1 inclusive. The conference of the Independent Labor Party was held in April. The report of its administrative council showed progress. At the meeting any policy which tended toward entangling alliances with political parties having other than socialistic aims was deprecated. As to the movement of wages during the year 1898 it was reported in the British press that agricultural wages had risen, the improvement in the condition of the agricultural laborer being the most marked in the eastern counties. In August, 1898, the labor department issued its fifth annual report. From this it appeared that 1897, like the previous year, was a time of progress and improvement for the working classes and that the wages of labor had steadily risen. See WAGES.

HISTORY.

The Parliamentary Session.—Parliament assembled February 8, 1898. Up to that time the public attention had been largely absorbed in the great engineering strike (see STRIKES and LOCKOUTS). The subjects of the Queen's speech included the revolt in India and the famine and the plague, the question of local government in Ireland, the measures for the increase of the army; and in foreign affairs the treaty of peace between Turkey and Greece, the condition of Crete, the campaign on the Upper Nile, and the economic condition of the British West Indies. The most important legislative measures recommended were for the new system of local government in Ireland, for the increase both in numbers and in efficiency of the army and for the relief of the industries reported to be suffering from depression in the West Indian colonies. There had been some sharp criticism of the government's course in regard to the northwestern frontier of India (see INDIA, paragraphs on History), and it was thought that the opposition would begin its attack at this point, but its spokesman, Sir William Vernon Harcourt, confined himself to somewhat mild comment on the subject. In the House of Lords the policy of the government in India and in China came in for some mild criticism on the part of the Liberal leader, Lord Kimberley. It was suspected that Great Britain was showing a lack of firmness in breaking her treaty rights. On this point Lord Salisbury said that the policy of the government was not at all likely to lead to the loss of any existing treaty rights, but on the contrary to the gain of new ones. As to Ta-lien-wan, England had not insisted on having that port turned into a treaty port on account of the embarrassment in which such a course would have involved the Chinese government, but Russia had given an assurance that she would throw open to British commerce

any port that she might require. A similar assurance had also been given by Germany which was inclined toward the British policy in respect to open ports. See the article CHINA (paragraphs on History).

An amendment to the address was moved by John Redmond, M. P., to the effect that the local government bill favored by the government in no wise met the demands for an independent Irish Parliament. The discussion of this amendment brought out unfavorable comment from the Liberal side and it was voted down by a large majority. Another amendment was offered by John Dillon, M. P., for the establishment of a Catholic University in Ireland. This measure had been discussed in 1897 and it received the support now, as formerly, of William E. H. Lecky, the historian, Member of Parliament for Dublin University, and the Hon. A. J. Balfour. It was declared that Ireland labored under great disadvantages in respect to the higher education and that existing institutions of higher learning had features which made them obnoxious to the Catholics. The measure had received the approval of the Archbishop of Canterbury, who declared that a majority of the clergy and bishops of the Anglican church were heartily in its favor. Another amendment was offered in the interests of the British manufacturers who were clamoring for some measure that would guard them against German competition in the home markets. Its advocates pointed to the stimulus which foreign governments gave to trade by means of bounties and tariffs and the relative disadvantage of the position of the British merchants in this respect. Countervailing duties were recommended as the only practicable remedy for this state of things. In opposition to this it was urged by the government that in spite of the foreign competition British foreign trade was in fact healthier than before; that Great Britain would have nothing to gain by abandoning her free trade policy, but that there had been some efforts made to induce foreign powers to cease granting sugar bounties and to secure better freight rates for English goods over German railways. These amendments were successively rejected and the Queen's speech was accepted as it stood.

Local Government Act.—The local government bill which was introduced on February 21 made rapid progress. Its main provision was the establishment of elective bodies in place of the existing nominated bodies to carry on local government. These bodies are the County Councils, Urban and Rural District Councils, and Boards of Guardians, whose members were thenceforth to be chosen by electors qualified to vote for Members of Parliament with the addition of peers and women. The qualifications for membership were the same as in England, except that ministers of religion were not eligible. The County Councils alone collect the rates and control expenditures. In addition to these fiscal duties the administrative duties of the old county bodies were transferred to the new, while the judicial functions were given over to the county courts. As to the amount contributed by the imperial treasury to the county it was provided that this should consist of a fixed sum equal to half the county rate and half the poor rate levied on agricultural land in a standard year.

The change from the nominating to the elective system gives a strong democratic character to the measure. It permits the Irish localities to manage their own affairs by means of elective county bodies. This had for more than ten years been the policy of the Liberal Unionists and it naturally received the support of the Irish members who, though not satisfied with all its provisions, regarded it as a step in the right direction. While it was not a substitute for the wider plan of an independent Parliament for Ireland, it was in no way inconsistent with that plan. The principle on which it is based is the principle of local government, which could be heartily supported by all Liberals. But it was not local government in the sense that all the inhabitants of the locality should have the right to an equal voice in the management of its affairs for the measure gave the control of the local expenditures to those who paid the largest share of the local taxes and under present conditions in Ireland, this class constitutes but a small proportion of the population. It has been estimated that about one-half of the revenue is drawn from hardly more than 10 per cent. of the population. All the Liberal factions, together with the Irish members, were ready to accept the bill in principle. It was one of the most important measures which the government had introduced in a long time. As it was under consideration for a considerable period there was a chance to give it great publicity and to profit by the discussion which it aroused throughout the country. In this way valuable suggestions were received and many of them were incorporated by the framers in the details of the bill. It passed its second reading without a division on March 21, 1898.

The Benefices Act.—On March 3, Mr. Balfour introduced for the government the Benefices Bill which had to do with the transfer and exercise of church patronage. Its aim was to lessen the chance for the appointment of unfit persons to ecclesiastical offices. On April 1 it was reported with amendments by a standing committee on law to which it had been referred. In the course of the discussion upon the measure Sir William Vernon Harcourt referred to the ritualistic practices in the Church, stating that there were grounds for the belief that there existed in the Church

of England a conspiracy for the purpose of overthrowing the beliefs of the English Reformation. He held that those priests who practiced rites and taught doctrines which were wholly at variance with the principles of the Church had committed perjury, and he asked whether the institution to a benefice ought not to be refused to such priests on that ground. He said, therefore, that it was the duty of the House to frame the act in such a manner as to prevent this gross violation of their oaths on the part of the clergy. To this Mr. Balfour retorted that it seemed unwise to oppose the measure merely because it did not embrace all possible reforms, when it did include some desirable improvements. Among the amendments proposed was one moved by Mr. Samuel Smith, on June 21, empowering a bishop to refuse to institute to a benefice any presentee who within five years just preceding had taught doctrines inconsistent with the Thirty-nine Articles, or practiced rites not authorized by the Book of Common Prayer; and he argued it was the duty of Parliament to prevent the corruption of the church by the introduction of these practices. It was said by Sir William Harcourt that thousands of the ordained clergy were deliberately plotting the overthrow of the law of the Church of England; that Protestant children were taught lessons wholly inconsistent with the religious views of their parents, and that members of the clergy were leading lives of deception, and concealing whenever the occasion demanded, their real views from the authorities. On the other hand, in the course of the discussion it was by some flatly denied that the bishops were favorable to such practices, and by one member Mr. Smith's amendment was characterized as an attempt to gain popularity by raising the cry of "No Popery again." This amendment was lost by a majority of 215 to 103. At its third reading, June 28, Sir William Harcourt made another speech which attracted wide attention. He referred to the inconsistency of the measure in excluding from the abuse which it sought to prevent the misconduct of clergymen in respect to practices and doctrines. On the other hand, Mr. Balfour held that the practice to which the opponents of the measure referred, did not properly fall within the scope of the bill. He admitted that such practices were illegal and injurious, but he deprecated any action which would tend to make the attitude of the church intolerant towards minor divisions of opinion on the part of members of its clergy. See ENGLAND, CHURCH OF.

The Vaccination Act.—The law regulating vaccination contained some rigorous provisions and there was much irregularity in its enforcement. Some officials did not proceed against those who violated the law, while others were zealous in carrying out its provisions. Of late years there has been strenuous opposition to vaccination in Great Britain and an anti-vaccination league has been formed. Some modification of the law was favored even by those who wished to have vaccination enforced, because without such modification it seemed impossible to prevent evasions of the existing statute. The report of a royal commission, which had been appointed to investigate the subject of vaccination, was published in 1896. This recommended, among other things, the provision that calf lymph should in all cases be used, that the infliction of repeated penalties upon those who persisted in avoiding vaccination should be abolished, that the period within which vaccination must take place should be extended from three months to six months from birth and that objectors to vaccination should be exempt from penalties if they satisfied the local authority that they really believed vaccination would be injurious to the subject or if they made a statutory declaration before a magistrate. The frequent evasions of the existing law as shown by the large increase in the number of the unvaccinated, led to the introduction of a vaccination bill in March, 1898. This embodied many of the recommendations of the royal commission. The act as finally passed included the following provisions: Glycerinated calf lymph was to be used; domiciliary vaccination was to be substituted for the system which required the attendance of persons at public stations; and those opposed to vaccination on conscientious grounds were exempted from penalties. When the measure was introduced it did not contain this last provision; but required the vaccination of all children and imposed penalties upon the parents if they failed to obey the law. An amendment was proposed permitting the parents to obtain an exemption from the penalties by declaring publicly their objection to submitting their children to vaccination. The medical practitioners generally opposed the adoption of this amendment. It was accepted in the House of Commons, however, and pressure was then brought to bear on the Lords to assert their independence and reject the amendment. This the House of Lords actually did, but when the bill was sent back with the amendment for the second time they gave way and accepted it in the form in which it passed the Commons. The bill received the royal assent on August 12 and went into effect on January 1, 1899.

Other Parliamentary Topics.—Among the important measures passed during the session were the Colonial Marriages Act, establishing the validity of a marriage with a deceased wife's sister which had been validly contracted in any British colony; and the Criminal Evidence Act, enabling all persons charged with an offence, together with the wives or husbands of such persons, to give evidence for the defence. The subject of old age pensions was much discussed, the matter having been laid before a

committee for consideration. The committee could not agree, however, upon any old age pensions scheme which it was willing to recommend to Parliament.

An administrative measure of importance was the final adoption of the Imperial penny postage plan. It was announced by the Postmaster-General on July 12 that the rate of letter postage would be reduced to 1d, per half ounce between the United Kingdom, Natal, Newfoundland and any of the other crown colonies that might choose to adopt it. On December 25 it was announced by the same authority that this reduction would take place throughout all parts of the empire with the exception of Australasia and Cape Colony (the latter not having yet notified the home government of its acceptance of the agreement).

The Fashoda Affair.—For an account of the Egyptian campaign and the battle of Omdurman, see the article EGYPT. General Kitchener was rewarded for his services by the title of Lord Kitchener of Khartoum and Aspell. After he had settled affairs at Fashoda he returned on a visit to England. In London he received an enthusiastic welcome and at a ceremony in Guildhall, at which the most distinguished statesmen of the country were present, he was presented with the freedom of the city. At the Guildhall banquet on November 5, a high tribute was paid by Lord Rosebery to the army and its leader, and the campaign just closed was declared by him to be the most brilliant in the military history of Great Britain. It wiped out, he said, the "bloodiest and most barbarous tyranny in the history of mankind." Lord Salisbury's toast was received with the greatest enthusiasm. In it he made the important statement that he had received from the French ambassador that afternoon the information that the French government had concluded that the occupation of Fashoda was of no sort of value. He said they had done what he believed every government would have done in the same position, namely, resolved that the occupation must cease. On this point he said in conclusion, "I must not be understood as saying that all causes of controversy are removed. That is not so. Doubtless there will be many discussions between us but a somewhat acute and somewhat dangerous cause of differences has been removed." On the same day (November 5) it was reported that Captain Baratier, the comrade of Major Marchand, who had returned to France at the same time that General Kitchener made his visit to England, had arrived at Cairo with confidential instructions from the French government to Major Marchand and it was given out that the government had resolved not to retain the Marchand mission at Fashoda, having reached this decision after exhaustive examination of the question.

Lord Salisbury's Address on Nov. 9.—Some surprise was felt when in spite of the closing of the Fashoda incident Great Britain continued her naval and military preparations. To some it seemed as if this was preliminary to the declaration of a protectorate over Egypt and every one looked forward to the Lord Mayor's banquet on November 9, which was to be the occasion of a speech from Lord Salisbury. The speech, however, did not make any definite announcements of a change of policy in Egypt, although it hinted at the government's determination on such a change in certain circumstances. As to the preparations for war Lord Salisbury said that although the immediate necessity for them had passed away, it was not possible to stop them at a moment's notice. They did not denote a desire for war on Great Britain's part, but merely a wish to be fully prepared in case danger should threaten. The Premier referred in his speech to the assassination of the Empress of Austria and announced that Great Britain had agreed to take part in a conference to decide upon measures for the repression of anarchy. He also spoke of the successful settlement of the Cretan question, paying a high compliment to the admirals who, he said, had successfully accomplished what the cabinets of Europe had been unable to do. Upon his mention of the rumor in regard to the supposed design of the government to declare a protectorate over Egypt, there was a burst of applause from his listeners, but he went on to say that he could not pronounce definitely on that matter, although he would not deny that England might be forced by others into a position which she did not at present occupy. He hoped it would not be necessary, however, to modify her present position since the change might endanger the peace of nations. He commented on the entrance of the United States as a new and powerful force in European politics and he held this to be a very serious matter and not conducive to peace, although likely to conduce to the interests of Great Britain. His speech was inconclusive in tone but contained certain dark and mysterious hints as illustrated in the following sentence: "We see nations decaying whose government is so bad that it can neither maintain the power of self-defence or retain the affection of its subjects and when this occurs there are always neighbors impelled by some motive—it may be the highest philanthropy or it may be the natural desire of Empire—to contest as to who shall be heir to the falling nations; that is the cause of war."

As to the Czar's famous appeal for disarmament the Premier expressed the heartiest sympathy with his motives but declared that Great Britain must still provide precautions needful to counteract the dangers surrounding her.

French Opinion of the Egyptian Question.—In France the importance of General Kitchener's victory was fully appreciated. There the battle of Omdurman was reckoned as one of the great battles of the age, and due honor was rendered to

Kitchener for his ability and foresight. It is interesting to note the attitude of prominent French writers toward the Fashoda affair. At first it was thought that the Europeans, whom the Sirdar had heard of in Fashoda, might be an expedition of the Belgians or of the Abyssinians. When it was known that it was really the mission of Marchand there was considerable excitement on both sides of the Channel, but the English press took the matter far more seriously than the French. The French complained of the fierce tone of the English press and attributed it to a deliberate intent to drag the two countries into war. The tone of the French press was self-restrained and its writers took a favorable view of the prospect of amicable adjustment. Meanwhile the members of Marchand's force maintained the most courteous and friendly relations with the English invaders. Nevertheless, in France the attitude of England occasioned alarm. It seemed to assume beforehand that the question could be decided in but one way, and that threats rather than diplomatic negotiations were the most promising means of securing an adjustment. To the French it seemed that the whole question of Egypt was to be opened anew. They pointed to the fact that when the expedition started for the Soudan the English newspapers declared that Egypt had organized it and that England really had no interest in it, and yet when the expedition had attained its end, these same writers boasted that success was due wholly to English officers, English troops and English money.

Here is a specimen of the way prominent French writers viewed the Egyptian question. The acts of Great Britain in connection with the Egyptian affair had, it was said, been wholly inconsistent with their words. By the French it was held that the time had now come for England to throw off her mask and assume responsibility for her acts. For sixteen years she had exercised over Egypt a kind of protectorate which had all the advantages and none of the disadvantages of actual possession. Egypt swarmed with her functionaries who, although they had no doubt done the country some good, had proved an expensive charge upon the Egyptian government. England had restored order in Egypt, but only through an army of occupation whose maintenance was costly to the natives. If she had reconquered the lost provinces of the Soudan it was due, said the French, less to consideration for Egypt than to her desire to avenge the death of Gordon and the repulse of General Wolseley. In short, all that England had done for Egypt had been done wholly in her own interest. It was furthermore believed in France that from the day on which the English entered Egypt in 1882, they had intended to remain. It was on account of this well-known intent that Cecil Rhodes had dreamt of an African Empire which should extend from Alexandria to the Cape, a dream which the taking of Omdurman now promised to render possible of realization. The assertions of English statesmen in regard to Great Britain's Egyptian policy were not, in the opinion of the French, worth the paper on which they were written. Fully persuaded that England intended to retain Egypt, they asked only on what terms they proposed to maintain their control. See FRANCE (paragraphs on History).

Sir Edmund Monson's Speech.—A good deal of excitement was caused on both sides of the Channel by a speech of Sir Edmund Monson, the British Ambassador to France, at an annual dinner held on December 6, at the British Chamber of Commerce, Paris. This speech was characterized as a venture in the "new diplomacy." It referred very pointedly to the existing situation and in the course of it the speaker seemed to throw aside the usual diplomatic reserve. There had been signs of an intention on the part of France to attempt a sort of rivalry with England in Egypt. At least this construction was placed by the English upon a proposal which apparently met with the approval of the French government, that French schools should be established at Khartoum, thus indicating that France intended to foster French influence in that region. Whether this was intended as a test of British feeling on the subject or was seriously contemplated by the government cannot be said. But if it sprang from the former motive it succeeded in evoking a very decided expression of opinion. Sir Edmund Monson gave warning that Great Britain would not go beyond a certain point in her concessions, and that it was advisable for France to desist from her policy of "pin pricks" which would necessarily result in a serious irritation of Great Britain. He disapproved of those petty manoeuvres of the French toward thwarting British influence or rivaling British enterprise in Egypt. This speech seems to have been in line with the views of prominent British statesmen expressed several times in the course of the year, as, for instance, in the speeches of Sir Michael Hicks-Beach, Mr. Chamberlain, and Lord Rosebery, but coming at such a time it naturally provoked sharp criticism. The tone of the British press was distinctly disapproving, and in France it was regarded as a further humiliation of the republic and another instance of the aggressive spirit of Great Britain. But while the general tone of the French press was resentful, there was evidence that the proposal in regard to the schools was a merely tentative one.

Settlement of the Fashoda Dispute.—In the latter part of December the British government received the news that Major Marchand had withdrawn from Fashoda



MAJOR-GENERAL HERBERT KITCHENER.

and retreated into the interior of Africa. Lord Salisbury had previously notified the French government that until this was done there could be no negotiations for the settlement of the African dispute. The way for such negotiations was now clear and on December 27 the British Premier proposed to the new French Ambassador, M. Paul Cambon, a joint commission for the delimitation of the frontiers. In his note, however, Lord Salisbury lays down part of the frontier and claims for England a sphere of influence including Bahr-el-Ghazal, Darfur, Borgu, and the region extending to the east shore of Lake Tchad. Between the French and British territories he proposes a line drawn westward from the watershed of the Ubangi, leaving to France the lands to the south and west of that line.

Rumors of Cruelty Toward the Dervishes.—The battle of Omdurman was followed by rumors of British atrocities toward the conquered dervishes that threatened to cause a scandal. A war correspondent declared that the treatment of the wounded dervishes was brutal in the extreme; that many of them were slaughtered in cold blood by their conquerors, and even when they were utterly unarmed. He admitted that in some instances it was fully justified, for the wounded dervishes were known to be dangerous, and there were many cases of the shooting of British soldiers, often in treacherous circumstances by the wounded men whom they were approaching. In many cases, however, he said, it was wholly unnecessary. He said, moreover, that the wounded were left for several days without aid and lay in the heat of the August weather, tortured by fever and thirst. He also charged the British troops with having pillaged the surrendered city and of desecrating the Mahdi's tomb. Women and children were shot down by the maxim guns which were fired into the midst of crowds of non-combatants. These statements and similar stories were, however, emphatically denied by others who had been present at the battle, and at Omdurman after it was captured. Nevertheless there was much excitement over the matter.

The Liberal Leadership.—In a letter to Mr. John Morley which was published on December 13, Sir William Vernon Harcourt resigned his position as leader of the Liberal party, saying that "a party which is rent by sectional disputes and personal interests is one which no man can consent to lead with credit to himself and advantage to the country." There had been for some time signs of a division in the Liberal party and some of its members have favored the return of Lord Rosebery to the leadership. Besides Rosebery the names most generally mentioned in connection with the succession to the leadership were Sir Henry Campbell-Bannerman, Sir Edward Grey and Mr. Herbert Asquith, but at the close of the year 1898 the question was still unsettled.

GREAT TELESCOPE. (PARIS EXPOSITION.) See ASTRONOMY.

GREECE. A country of Europe occupying the most easterly of the three large peninsulas that project into the Mediterranean Sea, has an area of about 25,014 sq. m., with a population in 1896 of 2,433,806. Its capital is Athens with a population in 1896 of 111,486. The main occupation is agriculture, which, however, is not well developed on account of the primitive methods employed, although the soil is unusually fertile. Farming is chiefly in the hands of peasant proprietors and the large landed proprietors are comparatively few. Of the cereal crops wheat is the most important, the average annual yield being seven million bushels. But barley, rye, maize and mezlin are also raised. Of fruits the most successfully cultivated crop is that of currants. The raising of olives and the culture of the vine and the silk-worm are also important. As to the mineral wealth, manganese, iron ore, hematite, zinc ore, speiss, silver lead and lead ore, galena, etc., are found in the Laurium district and among other minerals worked are magnesite ore, silicate of magnesia, barytes, sulphur, emery and gypsum. The manufactures are unimportant, but include the manufacture of engines, leather, thread, cloth, glass and flour.

Commerce.—In 1897 in spite of the war with Turkey, which impeded trade during the first half of the year, the exports from Greece were valued at \$15,581,676, an increase over 1896 of \$1,519,613, which was due chiefly to the increase in the exports of currants. The imports into Greece during the year 1897 were \$22,148,975, also an increase over 1896 of \$223,284, chiefly due to the increase in the imports of cereals. In connection with a proposal for a direct line of steamship from the United States to ports of the eastern Mediterranean, a Consular Report was submitted in 1898 on the subject of the trade of the United States with Greece. It appears from this that there has been a tendency towards an increase of trade, but that it was checked somewhat by the war with Turkey in 1897 and the war between the United States and Spain in 1898. Greek groceries and other products are said to be exported in increasing quantities to the United States. The establishment of direct steamship communication was expected to result in a great increase of trade between the two countries for Greece imports in large quantities classes of goods which can be produced advantageously and cheaply in the United States.

Finance.—By the terms of the treaty of peace with Turkey in 1897 Greece agreed to pay an indemnity of \$20,000,000, and as a guarantee for its payment accepted the

control of her finances by an international commission. Representatives of the six mediating powers constituted this commission and to it have been assigned the following revenues: monopolies, tobacco tax, stamps and the Piræus customs, as security for the loan which the government was authorized to raise. The revenues from these sources were estimated for the year 1898 at 39,600,000 drachmæ and supplementary revenue valued at 7,200,000 drachmæ was assigned from the customs in case of a deficiency. The total revenue for 1898 from all sources was estimated by the commission at 85,556,000 drachmæ and the expenditure at 63,251,000 drachmæ. The principal sources of revenue are the customs and excise, direct tax, stamps and dues and monopolies and the heaviest branches of expenditure are the service of the public debt and the ministries, army and the interior. The public debt was estimated on January 1, 1897, at 656,028,888 gold drachmæ and 168,645,543 paper drachmæ. It was estimated that the amount necessary to pay the indemnity meet the needs of the treasury and redeem the floating debt was 123,152,000 gold drachmæ.

Army and Navy.—All able-bodied males 21 years of age are liable to military service. The events of 1898 revealed the fact that the Greek army was much stronger on paper than in reality. It was ill-disciplined and badly officered. On a peace footing the nominal strength of the army in 1896 was 25,333 officers and men, which on a war footing could be raised, it was said, to 82,000 men. There is also a territorial army whose numbers are estimated at 96,000 men. The navy consists mainly of 5 armor-clads with a personnel of about 3,165 men. The war of 1897 proved it to be less efficient than had been expected, for it was for the most part inactive and accomplished little.

Government and Political Parties.—Greece is a limited monarchy, the executive authority being vested in the King and the legislative in a single chamber known as the Boulé, which meets annually and comprises 207 representatives elected for four years by manhood suffrage. There is a ministerial council consisting of the President and the Ministers of Interior, Finance, Justice, Marine, War and Public Instruction. The religion of the State is the Greek Orthodox Church, but there is complete freedom of worship guaranteed to all subjects. The King, George I., together with his ministers, incurred unpopularity on account of the reverses sustained by the Greek arms in 1897. M. Delyannis, one of the most prominent statesmen of Greece and several times Premier, was dismissed from office by the King in April, 1897, on account of the popular feeling against him in consequence of the war. He was succeeded by M. Ralli, who held office until September 30, 1897, when M. Zaimis formed a cabinet which remained in office until November 7, 1898.

HISTORY.

The war between Turkey and Greece lasted barely a month, but peace negotiations were prolonged for seven months. The preliminary treaty was signed on September 18, 1897, but the final treaty was not signed until December 4. It was ratified two weeks later by the Sultan and after having passed the Greek Chamber received the approval of the King. It is a lengthy and very detailed instrument. The most important points in it are as follows: The Greek frontier was rectified in the interests of Turkey, the latter power acquiring important strategic advantages. The delimitation of the frontier was placed in the hands of a commission consisting of representatives from the two governments, and of delegates chosen by the ambassadors of the mediating powers. Greece was required to pay an indemnity amounting to about \$17,600,000 in our money, also to pay the arrears of interests on her bonds. As a guarantee for the war indemnity and the interest on the debt an international commission, consisting of six representatives from the mediating Powers, was to have control of such a portion of the Greek revenues as were required for meeting the above mentioned obligations. As soon as the Powers should declare that the conditions of the treaty had been fulfilled Turkey was to evacuate Thessaly. The minor points of the treaty were concerned with the exchange of prisoners of war, the granting of amnesty to persons interested in the war, the indemnification by Greece of certain private persons for losses during the war, a mutual concession of the right of residence in each country to the inhabitants of the other, the resumption of postal and telegraphic relations, etc. It is a very significant thing that the Cretan question, which was the main cause of the war, received no notice whatever in the treaty.

It seemed to be the common opinion that Greece had fared as well by this treaty as she had a right to expect. Public opinion in foreign countries seemed on the whole unsympathetic toward Greece in her defeat. She had complicated the Turkish difficulty. She had added to the prestige of Turkey as a military power, and had checked the efforts of foreign powers to enforce reforms upon the Porte.

When the terms of the treaty were known in Greece much public discontent was shown. The government was attacked vigorously in the press and on February 26 an attempt was made to assassinate King George. He was returning from a drive to the Phalerum with his daughter, the Princess Marie, and when a short distance from

Athens was fired upon by two men by the side of the road. One of the shots wounded the King's footman, but further than this no harm was done. The murderers ran away, but were soon captured. No others were found to have been involved in the conspiracy, though it was reported at first that the murderers were members of a secret club which had been formed for the purpose of assassinating the King. The effect of this cowardly attempt was to bring back to some extent the loyalty of King George's subjects. He was greeted with shouts and cheers by the crowd and a *Te Deum* was sung in the Cathedral the next morning. The terms of the treaty required that the Turkish troops should be withdrawn from Thessaly within a month after the loan for the payment of the Turkish indemnity had been satisfactorily arranged. Owing to a delay in settling upon the details of the loan the Turkish evacuation did not take place until the summer. On June 6 it was announced that all Turkish troops had been withdrawn and that the Greeks had occupied Thessaly. Early in the session of the Chamber the bill providing for the international control of the finances was passed. The session was closed in April after authorizing the issue of the loan. On November 7 the Zaimis Cabinet resigned, anticipating hostilities from the new chamber, but M. Zaimis, at the desire of the King, formed a new cabinet. The opening of the Chamber was postponed from November 12 to November 27. The programme of M. Zaimis comprises many reforms, including the increase of the police force, the reorganization of the army, the introduction of technical education, improvements in the system of taxation and the recommendation of a more stringent press law. See ARCHÆOLOGY.

GREEK ARCHÆOLOGICAL SOCIETY. See ARCHÆOLOGY (paragraph Greece).

GREEK CHURCH in the U. S. consists of two divisions: the Greek orthodox, with 4 ministers, 3 churches, and 5,030 members; and the Russian orthodox with 39 ministers, 29 churches, and 43,000 members.

GREEK LITERATURE, MODERN. *History.*—The war against Turkey naturally had a prejudicial effect upon literary production in 1898. There are however a number of historical works which deserve mention, and first in importance is a *History of the Empire of Nicæa and the Despotism of Epirus (1204-1261)*, by Anton Miliarakis, already favorably known for his works on geography. The *History of Trebizond from the Earliest Times to our own Days*, by Tryphon Evangelides, is also a useful work, containing much new material, but is lacking in method. A *History of Nauplia from the Oldest Times to the Present Day* by Michael Lambrynides, is praiseworthy as a pioneer work, although it shows the author's lack of preparation. A volume of political, as well as historical value is *Foreign Rule and Kingship in Greece, (1821-1897)*, by George Philaretos, the former Minister of Justice who endeavors to prove that Kings Otto and George have both been used as fools to satisfy the interests of foreign powers.

Poetry and Fiction.—Among books of poetry may be mentioned *The Grave*, by Kostis Palamas, which is the lyrical and somewhat mystical tribute of a father to a well-beloved son, and *Songs of the Desert*, by Konstantin Hatzopoulos, who writes under the pseudonym of "Petros Vassilikos," and who here as elsewhere reveals his keen delight in nature. Among writers of fiction should be mentioned Kostas Passajannis and Eugenie Zographu, who have both produced some readable short stories. A more pretentious effort is *The Dream of Jannaris*, a love story, written in the popular dialect, but somewhat lacking in action. The author is Johann Pyscharis, a professor of Modern Greek at Paris.

GREEN, JOSEPH F., Rear-Admiral (retired) U. S. N., died in Brookline, Massachusetts, December 9, 1897. He was born in Maine, November 24, 1811; became midshipman in 1827, lieutenant in 1838, commander in 1855; and captain in 1862. In the Mexican War he participated in all the important operations along the Pacific coast; during the Civil War was on blockading duty and took part in the bombardment of Fort Wagner. He was promoted to the rank of commodore in 1867, to that of rear-admiral in 1870, and was retired the following year.

GREENLAND, a region whose northern limits have not been defined, lies to the northeast of America and has an estimated area of 46,740 sq. m., with an estimated population in 1890 of 10,516 gathered in the towns and settlements along the coast. The interior is not habitable. Greenland is a colony of Denmark and the trade is a monopoly of the Danish government. In 1896 the exports were 406,000 kroner, and the imports 557,000 kroner, the chief export trade being in whale and seal oil, the skins of the seal, reindeer and fox, cryolite, and eiderdown. For an account of the recent exploring expeditions which have entered Greenland or passed along its coast see the article ARCTIC EXPLORATIONS.

GREGORY, Sir CHARLES HUTTON, K. C. M. G. (1883), eminent English civil engineer, died January 10, 1898. He was born at Woolwich October 14, 1817. He constructed various engineering works in England and abroad; was at one time presi-

dent of the Institution of Civil Engineers; and was consulting engineer to crown agents for the colonies, and to some colonial governments. In 1894 he married Mrs. Stirling, the well known actress, who died the following year.

GREGORY, JOHN MILTON, LL. D., died in Washington, October 19, 1898. He was born at Sand Lake, New York in 1823; after his graduation from Union College in 1846, he studied law but gave it up for the ministry and later became principal of a school in Detroit. From 1853 to 1858 he edited the *Michigan Journal of Education*; in that year he was elected, as a Republican, State Superintendent of Public Instruction, and was returned to the office for two terms, serving until 1864. He was president of Kalamazoo College for three years, and in 1867 accepted the presidency of the University of Illinois in which position he remained until 1880. Mr. Gregory was United States commissioner to the World's Fair at Vienna in 1873 and Illinois commissioner at the Paris Exposition of 1878; he was also judge in the educational department of the Centennial Exposition at Philadelphia. In 1882, he was appointed by President Arthur a member of the first Civil Service Commission, retiring in 1885. He had travelled widely and was the author of several books.

GREY, Rt. Hon. Sir GEORGE, D. C. L., LL. D., K. C. B., who was styled "the veteran colonial administrator" and "the founder of the British South African Empire," died September 19, 1898. He was born at Lisburn, Ireland, in 1812. He established an excellent record as an Australian explorer and as colonial governor in South Australia, New Zealand and South Africa. In early life he was a captain in the Eighty-third Foot; Lieutenant-Governor of South Australia, 1841; Governor of New Zealand, 1846-54, 1861-67; Governor and Commander-in-Chief of Cape of Good Hope, 1854-61; Premier of New Zealand, 1874-91. He was the author of *Journals of Discovery in Australia* (1841); *Polynesian Mythology and Traditions of New Zealand* (1855); *Proverbial Sayings of the New Zealand Race* (1858). He retired from public life upon leaving the premiership of New Zealand in 1891.

GRIDLEY, CHARLES VERNON, Captain, U. S. N., died at Kobe, Japan, June 4, 1898. He was born at Logansport, Indiana, in 1845; entered the United States Naval Academy from Michigan in 1860, and was graduated October, 1863; served in the West Gulf blockading squadron and later in the South Atlantic squadron. He served on various ships and was successively promoted, reaching the rank of commander in March 1882. He was promoted to the rank of captain in March 1897, and was assigned to the command of the *Olympia*, of the Asiatic squadron; in the battle of Manila Bay May 1, 1898, he commanded this vessel, then Admiral Dewey's flagship. On account of ill health augmented by the Manila expedition, he was ordered home by Admiral Dewey and died on the way. He showed great bravery and ability in the Manila fight.

GRIGGS, JOHN WILLIAM, Attorney-General of the United States, successor to Joseph McKenna in the McKinley Cabinet, was born in Newton, Sussex county, New Jersey, July 10, 1849. After graduation from Lafayette College in 1868, he began the study of law in the office of Robert Hamilton at Newton; removing to Paterson in 1871, he continued his study in the office of Socrates Tuttle and in the same year was admitted to the bar. In 1875 he was elected from Passaic county to the State Assembly, and reelected two years later, but in 1878 suffered defeat. Beginning with 1882 he was State Senator for three two-year terms, in the last of which he was President. Mr. Griggs in 1895 was elected Governor, being the first Republican to hold that office in New Jersey in twenty-five years; his plurality over Alexander T. McGill, the Democratic nominee, was 26,900. Upon the transfer of Mr. McKenna from the Cabinet to the Supreme Court in January 1898, Mr. Griggs was appointed, January 22, to fill the vacancy, the appointment being confirmed by the Senate three days later. Since there is no Lieutenant-Governor in New Jersey, the governorship devolved upon the President of the Senate, Foster M. Voorhees, who assumed the title of acting Governor on February 1. In the November elections of 1898, Mr. Voorhees was chosen Governor for the regular term, on the Republican ticket. Mr. Griggs is president of the Paterson National Bank and of the Paterson Safe Deposit Company.

GRIPPE. See EPIDEMIC INFLUENZA.

GROSS, Rev. WILLIAM HICKLEY, D. D., Roman Catholic Archbishop of Oregon, died in Baltimore, Maryland, November 15, 1898. His family came to America from Alsace in the latter part of the last century. Bishop Gross was born in Baltimore June 12, 1837; after studying at St. Joseph's College he entered the novitiate of the Redemptorist order in 1857 and in 1863 was ordained to the Priesthood. During the Civil War he ministered to the sick and wounded; he engaged in mission work in New York for about five years and in 1871 was sent to Boston to continue the work in that city. In this work he seems to have been eminently successful; in Boston he became Superior of the Redemptorists. He was appointed in 1873 to succeed Bishop Persici, of Savannah, Georgia, and was consecrated on April 27

of that year. Upon the resignation of Archbishop Seghers, of Oregon, the Holy See chose Bishop Gross to fill the vacancy.

GUADELOUPE, a French possession east of the Caribbean Sea, comprising two islands separated by a narrow channel, has a total area together with its dependencies, of 583 square miles and a population of about 167,000, including 15,000 coolies. The dependencies are the small islands Les Saintes, Désirade, St. Martin, Marie Galante, and St. Barthélemy. The principal town is Pointe-à-Pitre (pop. 17,100). The colony, which is represented by a senator and two deputies, is managed by a governor and elective council. In 1897 the debt was 1,000,000 francs, and the revenue and expenditure balanced at 7,120,000 francs (\$1,393,460); the expenditure of France, according to the budget of 1898, was 1,652,000 francs (\$318,836). The chief product is sugar, coffee, and cacao ranking next; other products are bananas, sweet potatoes, maize, tobacco and vegetables. In 1896 the imports amounted to 21,762,773 francs, (\$4,190,215), and the exports to 18,713,095 francs (\$3,627,241). There are 97 elementary schools with about 11,000 pupils, and a lyceum with 350 students.

GUAM, the southernmost, largest, and most populous of the Ladrões (q. v.) or Marianne Islands belonging to Spain, 1,500 miles east of the island of Luzon in the Philippines and 1,350 miles south of Yokohama. It is about 30 m. long and from 3 to 10 m. wide. The population in 1887 was 8,561, but is now estimated at 10,000. In the north the surface is level and barren; in the south it is uneven and of volcanic tition. The southern portion is the best watered and the most fertile. The soil is clayey. The chief products are rice, sugar, cocoa and indigo. A coral reef surrounds the coast, which it renders inaccessible in the northeastern portion, but channels divide it on the other sides of the island. On the western coast are the small harbor of Caldera de Apra, the bay of Umatak, and the town of Agaña, the capital of the island, which is fortified, and has a population of about 3,000. During the war between the United States and Spain, Guam was captured by Captain Glass, commanding the United States cruiser *Charleston*. The latter entered the harbor of San Luis and a landing was effected on June 21. The Governor-General and other officials were taken prisoners. There was only a handful of troops on the island, and the attack was wholly unexpected, the inhabitants not even knowing that war had broken out between the United States and Spain. The treaty of peace surrendered Guam to the United States. On December 23, the *Bennington* was ordered from Honolulu to Guam to take possession of the property formerly belonging to the Spanish crown.

GUATEMALA, a Republic of Central America, comprising 22 departments, whose aggregate area is estimated at 63,400 square miles, and whose population, according to the census of 1893, is 1,364,378, of whom about 60 per cent. are Indians and the greater part of the remainder mixed bloods. There are very few inhabitants of pure Spanish descent. The capital is Guatemala le Nueva, which has about 65,000 inhabitants, over 60 per cent. of whom are of European extraction; the other more important cities are Totonicapan (pop. 40,000), Quezaltenango (30,000), Coban (27,700), San Marcos (16,000).

Government.—The Republic was established in March 1847. By the Constitution, which was adopted in 1879, and modified in 1885, 1887, and 1889, the chief executive authority is vested in a President, who is elected for six years and who is ineligible for the succeeding term. The executive functions are exercised through a cabinet of six departments, namely, Foreign Affairs, Hacienda and Public Credit, Government and Justice, Fomento, War, Public Instruction. The President in 1898 was Don Manuel Estrado Cabrera. The legislative authority devolves upon a House of Representatives, the members of which are chosen in the proportion of one for each 20,000 inhabitants for a period of four years, by popular vote. There are justices of the peace in all the municipalities, 26 courts of first instance, 6 courts of appeal, and a Supreme Court. In 1896 the regular army consisted of about 7,000 officers and men. The effective army, composed of men from 18 to 30 years of age, is said to number 56,900; and the reserve, composed of men from 30 to 50 years of age, is placed at 30,000. About one-tenth of the public expenditure is used for the army.

Finance.—Revenue and expenditure in pesos have been:

	1894.	1895.	1896.
Revenue	11,851,026	14,491,667	15,150,741
Expenditure	13,577,034	15,515,081	17,437,452

The revenue is derived mainly from customs and taxes on alcoholic liquors, tobacco, etc.; the expenditure is chiefly for public debt, war, and public instruction. The outstanding external debt in 1897 was £2,009,815 (about 22,448,620 pesos); the internal debt was 7,319,955 pesos. There are six banks of issue. According to the quarterly estimate of the Director of the United States Mint, the value of the peso

on October 1, 1898, in United States currency was \$0.436. The currency of the country is mostly paper, the value of the paper peso being about equal to that of the silver.

Industries and Commerce.—The country is essentially agricultural, the soil being for the most part very fertile. The principal exports are coffee (over 22,340,000 pesos in 1896), bananas, hides, and rubber; other important products are sugar and cereals. The imports in currency for 1896 are stated to be 26,287,145 pesos and the exports 23,085,544. The foreign trade is carried on chiefly with the United States, Great Britain, Germany and France. Among the principal imports are textiles, tools, and machinery. Various minerals are found, but hitherto have been little worked; among these are gold, silver, copper, tin, lead, salt, and sulphur. There are some fairly prosperous manufacturing interests, including woolen and cotton mills, plants for cement, earthenware, etc., cigar factories, sugar mills, breweries, etc. It is said that agricultural and commercial conditions have of late been apparently very prosperous; but it seems that the country does not reap the benefit, for there has been a series of annual deficits. The reason is perhaps due to the fact that the large coffee plantations are owned by German stock companies and the profits are turned over to non-resident German stockholders. It is said that German property in Guatemala is valued at \$35,700,000, while there are not more than five hundred resident Germans in the country. On August 12, 1898, a decree was issued increasing the import duties, payable in gold or its equivalent in silver, to 30 per cent. The decree contained other claims denoting a general advance in tariffs.

Shipping, Communications.—Some good roads exist in the country, but much traffic is accomplished by pack mules. There are several railroads. Besides the new line connecting Iztapa with the capital, there are the lines connecting the capital with Esquintla and San José, and Champerico, and Retalhuleu and San Felipe, the three aggregating about 150 miles. Other lines are under construction. A subsidy of about \$8,000 a mile is guaranteed by the government. After the assassination of President Barrios in February, confidence was soon restored in the government under Acting President Cabrera. The project of the Northern Railroad had been originated by President Barrios and the road, which was in process of construction at his death, continued in building during the year. A contract between the government and two Americans, Messrs. May and Jekyll, to operate the road, the major portion of which was already completed, went into effect April 15, 1898. About the same time the Acting President was empowered by the National Assembly to enter into a contract with an English corporation known as the Pacific Steam Navigation Company, and the Chilean Compañía Sud Americana de Vapores for carrying mails between Ocos and Chile; the companies were to receive an annual subsidy of \$15,000, or of \$30,000 when the service should be extended to San Francisco. In 1896 the total length of telegraph lines was 2,980 miles, and there were 212 post-offices.

Religion and Instruction.—There is no state religion and all faiths are tolerated, but Roman Catholicism prevails. Education is gratuitous and obligatory. In 1898 the government primary schools numbered 1,266, of which 458 were for girls. The number of pupils enrolled was 75,020, of whom over 64,000 were in attendance. There are also a number of schools for secondary education, normal schools, and schools for special and professional instruction. There is a national library of over 19,000 volumes. In 1896 there were 37 periodicals published, of which 7 were dailies.

History.—The revolt which occurred in Guatemala in 1897 was suppressed by President José María Reyna Barrios by the middle of November. In the previous month the important town of Quezaltenango was retaken by the government party, whereupon the revolt was practically abandoned, although the rebels achieved a few minor successes some weeks later. The rebellion came actually to an end when President Barrios forced the leaders, Generals Morales and Fuentes, to leave the country. They retired to Mexico and thence to San Francisco. Among the rigorous measures taken by President Barrios for repressing the revolt were forced loans from wealthy citizens and business firms. The President did not conduct these financial affairs in accordance with the wishes of a wealthy merchant and well-known financier, Don Juan Aparicio, who refused to respond to the demand for loans and took the side of the rebellion. As a result he was seized by the Military Governor and shot. This execution probably would not have taken place had not Generals Morales and Fuentes persisted in attacking Quezaltenango, where Aparicio was imprisoned. On February 8, 1898, a former employee of Aparicio, Zollinger by name, being determined to avenge the execution, shot President Barrios, and in turn immediately fell under the fire of the President's guards. It was stated that for a long time a reward of \$100,000 had been publicly offered to any one who would assassinate the President. In some quarters it was also thought that Zollinger was the instrument of a secret organization which was aiming to destroy the united action on the

part of the republics, which had shown itself in the formation of the "Greater Republic" and later of the "Republic of Central America." (See CENTRAL AMERICA.) Señor Barrios was succeeded by Vice-President Manuel Estrada Cabrera, who met with little opposition, although some of the leaders made a vain attempt at resistance. Señor Cabrera, on assuming the administration, issued, March 13, a decree of amnesty to all persons driven out during the régime of President Barrios. On September 8, 1898, he was elected President.

GYMNASIA. See MUNICIPAL GYMNASIA.

GYMNOSPERMS. See BOTANY (paragraph Spermatozoids in Gymnosperms, etc.).

GYNÆCOLOGICAL SOCIETY, AMERICAN, organized in 1870. Membership limited to 100 active and 40 honorary fellows. Next annual meeting at Philadelphia, Pa., in May 1899. President, J. T. Johnson, M. D.; Secretary, J. M. Baldy, M. D., Philadelphia, Pa.

GYP SUM. France leads the world in the production of gypsum, with the United States second and Canada third. The producing States in the order of their importance are Michigan, Kansas, New York, Iowa, Virginia, Colorado, and California. The domestic production in 1897 amounted to 224,254 short tons, valued at \$573,344, and the imports were 163,320 long tons valued at \$212,429. Most of the imported material was used for making plaster of Paris, for which it is well suited, but there is a growing application of the American product for this purpose. Professor Lacroix's recent work on the classic deposit of the Paris basin, shows that it is perhaps the richest in mineral of any sedimentary region; in fact, this locality is looked upon by some as the birthplace of modern mineralogy. The gypsum occurs either as crystal or as strata up to ninety feet in thickness, and these beds have for many years furnished the plaster of Paris. Twenty associated minerals are found, and they result often from the alteration of the gypsum.

GYPSY MOTH AND GYPSY MOTH COMMISSION. During the year 1898 the public authorities of Massachusetts were very active in their endeavors to exterminate the gypsy moth. A brief introductory sketch of the origin and nature of this pest may be of interest. The introduction of the gypsy moth (*portheiria dispar*) into Massachusetts in 1868, was an event of not only biological but, as the sequel has shown, great economic importance. It was introduced by Mr. L. Trouvelot, a French artist and scientist, then living in Medford, Mass., in connection with some experiments he was making in the cultivation of various caterpillars for the production of silk. Through an accident some of the insects escaped and Mr. Trouvelot, well aware of their destructive habits, promptly published the fact and warned his neighbors. The gypsy moth is a native of Europe and Asia extending from Spain to Japan, and though a cause of great injury to all sorts of vegetation it is held in check by numerous natural enemies. These, however, are wanting in this country and its unrestrained increase would in a few years result in losses of millions of dollars. It was some years, however, in gaining a foothold in Medford and it was not until 1889 that the caterpillars became so abundant, it was determined to ask the legislature of the State for aid in their destruction. The petition of the town of Medford was supported by the State Board of Agriculture and by scientists generally, and accordingly a special "Gypsy Moth Commission" was appointed by the Governor and \$25,000 was appropriated by the State "to exterminate" the moth. Later in the year this appropriation was doubled. That extermination of the insect was considered feasible was due to certain interesting points in its natural history. The eggs are laid in clusters of several hundred (1,400 have been found in one cluster) on the bark of trees, on fences, walls, stones, etc., often in the most exposed situations. They are mixed with, and well covered by, a mass of yellowish hairs from the abdomen of the female moth, which serve as an effective protection, but causes the eggs-cluster to be conspicuous objects against a dark back-ground. This makes it easy to find and destroy the eggs, during the fall and winter. If not destroyed they hatch in the spring when the leaves are beginning to appear, and the young caterpillars begin at once their destructive work. They are very hardy and grow rapidly. When fully grown they measure over an inch and a half long and a quarter of an inch wide. They are dark bluish-gray in color, with blue tubercles on the front segments and red ones behind, and they are thickly covered with long yellow or brown hairs. As they approach maturity, they are accustomed to crowd together during the day on the underside of large branches or in other sheltered places and feed only at night. This habit has been taken advantage of and actually millions of the caterpillars have been destroyed by tying bands of burlap around the trunks of trees and each day killing the caterpillars which have crawled beneath them. The caterpillars are ravenous eaters and feed on almost anything vegetable, not even pines and cedars being exempt, though fruit and

shade trees are their favorites. The use of Paris green and other insecticides has not been very successful in destroying them as they are able to consume without injury extraordinary amounts of arsenical poisons. They pupate in sheltered places, often large numbers together, each one forming a slight cocoon of silk. The pupæ are usually an inch long or less and of a chocolate or reddish-brown color. At the end of ten days or two weeks the moth emerge. The males are brownish-yellow with dark-brown markings and measure over an inch and a half across the wings. They are active and fly by day. The females are larger (two inches or more) and are yellowish-white with a few black or brown markings on the front wings. They are very sluggish and do not fly at all, but after emerging from the cocoon lay their eggs at that spot or close by. It is due to this fact that the spread of the moth has been confined to such a small area in Massachusetts, and it is on this fact that the best hope of extermination rests. The money appropriated by the legislature in 1890 hardly more than sufficed to make clear the magnitude of the undertaking. The following year the special commission was abolished and the work was put under the control of the State Board of Agriculture, \$50,000 being appropriated for carrying it on. During the year 1898 about 250 men were employed in the work and the district in which the gypsy moth occurred was well mapped out. Up to 1898 the State appropriated \$725,000, and with this sum great progress has been made. During the past year (1898) \$190,000 has been available for the work, so that more has been accomplished than in any previous year. Three hundred men have been employed throughout the entire year and the infested area has been so greatly reduced that only in four towns can the gypsy moth be called common. Since 1891, at least a dozen townships have been entirely cleared and badly infested areas have been reduced from sixteen to four, and it is hoped that a few years more of such work will result in the complete extermination of the pest.

GZOWSKI, Colonel Sir CASIMIR STANISLAUS, K. C. M. G. (created in 1890), a prominent civil engineer and politician, died in Toronto, Ontario, August 24, 1898. He was the son of a Polish nobleman and was born in St. Petersburg, Russia, March 5, 1813. After the final defeat of the Polish insurgents, whose cause he supported, he was exiled to the United States, where he remained four years, and then settled in Toronto. Sir Casimir was made Staff Officer to the Engineer Force in Canada and Aide-de-Camp to the Queen. He was first President of the Canadian Society of Civil Engineers and first Chairman of the Niagara Falls Park Commission.

HAITI, a Republic comprising the western part of the island of Haiti, has an estimated area of 10,204 square miles, and a population variously estimated at from 572,000 to 960,000, but the probability is that the latter figure is more nearly correct. About nine-tenths of the inhabitants are negroes and the rest chiefly mulattoes. The capital is Port-au-Prince, whose population is estimated between 40,000 and 60,000; other cities of importance are Cape Haytien (pop. about 29,000) and Les Cayes (pop. about 25,000). Although primary instruction is free and nearly 1,000,000 gourdes are yearly appropriated for education, the latter is in a very backward condition. Besides five public lyceums and various private schools, there are about 400 schools under government maintenance. The official language of Haiti is French, but the language spoken is a French dialect. Roman Catholicism is the prevailing religion.

Government, etc.—Haiti, formerly a French colony, became independent in 1804. By the constitution adopted in 1867, the chief executive authority is vested in a President, who, according to the Constitution, must be elected by the people; often, however, the choice has been made in some other manner, as by the Senate and House of Representatives, by the army, or by party delegates. The President is assisted by a cabinet administering four departments. General Tiresias Simon Sam was elected President for the term beginning April 1, 1896. His salary is about \$23,300. The legislative power devolves upon a Congress, called the National Assembly, consisting of a Senate and a House of Representatives. The Senators number thirty-nine and are named by the House of Representatives from two lists submitted by the electoral and executive colleges, and they serve for six years. Representatives are chosen for a term of three years by popular vote. The army is nominally composed of 6,828 men. The navy consists of six small vessels ranked as third-class cruisers.

Finance.—The total revenue of Haiti in gold gourdes in 1893 was 7,691,580; in 1895, 7,406,321. The expenditure for the fiscal year 1894-95 was 8,042,705 gourdes, and for the following year, 8,984,539 gourdes. Duties on imports and exports are by far the most important sources of revenue. Import duties have recently been increased about 25 per cent. in order to effect a loan of \$3,500,000, gold, for the purpose of retiring the paper currency and placing the government on a gold basis. In 1898 the business community favored a reciprocity treaty with the United States, but this was impossible, since the revenue is so largely derived from import duties; there is no tax levied on real and landed property. The total external public debt (April 1897) was reported at 13,476,113 gourdes gold; and the internal debt 4,487,105

gourdes gold and 10,812,574 gourdes paper. The gourde, or dollar, is worth (October 1, 1898) \$0.965 United States currency.

Commerce, Industries, etc.—Agriculture is the chief industry, and the principal exports are coffee, cocoa, and logwood. For the fiscal year 1895, these products were exported as follows: Coffee, 75,371,865 lbs.; cocoa, 2,291,548 lbs.; logwood, 138,042,053 lbs. To some extent honey, gum, and cotton are also exported. According to the *Statesman's Year Book*, the coffee exports from Port-au-Prince in 1896 amounted to 6,988,617 lbs.; from Les Cayes, 8,500,000 lbs.; from Gonaives, 6,827,675 lbs.; the export of logwood from Gonaives was 26,410,150 lbs.; from Les Cayes, 11,200,000 lbs.; from Port-au-Prince, 4,929,000 lbs. In 1895 the total exports were said to amount to 13,788,562 gourdes and the imports to 6,232,335 gourdes; in 1896, exports, 9,463,903; imports, 6,053,835. The principal imports are textiles (chiefly cotton) and iron goods. The foreign trade is with the following countries, named in order of importance: United States, France, Germany, Great Britain. Besides logwood, there are many other valuable woods in Haiti, but the exploitation of the forests, as well as all other industries, is impeded by the wretched condition of the roads. There are said to be mines of zinc, copper, and salt.

Railways.—In the summer of 1898 it was announced that a narrow gauged railroad was about to be built from Cape Haytien to La Grande Rivière du Nord, eighteen miles to the northeast. The estimated cost of the road was \$250,000, while the capital stock of the company was \$450,000; a general subscription was invited for 675 shares at \$500 a share, the government making a guarantee of interest at 8 per cent. The government concession to the company is to remain in force for sixty years, and all goods necessary for the construction and maintenance of the road are to be exempt from import tariffs. It is thought that even this short road will prove to be a very considerable aid to agriculture and commerce, as the methods of transportation at present in Haiti are very primitive, the roads being in very poor condition and in the rainy season almost impassable.

Coal Mines.—The following facts relative to the coal mines of southern Haiti are taken from a report of engineer Henri Thomasset: Many traces of coal were found in the valley of Asile and in some places outcrops of 10 centimeters to 120 centimeters in thickness. Samples from these veins upon analysis showed the following composition: water 26.86, ashes 15.35, volatile matters other than water 32.56, fixed carbon 25.23. Other deposits were found along the Serpente River and at Camp-Perrin, the latter place being about 25 kilometers north of Les Cayes. Other veins from 65 to 150 centimeters in thickness were found at the right bank of the Ravine River, and also deposits appeared near the river Bras Gauche. An average sample taken from these veins showed the following composition: water 27.74, ashes 17.22, volatile matters other than water 27.06, fixed carbon 27.98. It is obvious that the analyses given above do not show the presence of excellent coal in that region. The samples, however, were taken from near the surface, and as some taken at greater depth gave much better results, it was thought that at a depth of 15 or 20 metres the coal obtained would prove to be of a very excellent quality. The exploitation of the mines would necessitate the construction of 25 kilometers of railroad into Les Cayes.

HALL, ABRAHAM OAKLEY, ex-Mayor of New York, died in that city October 7, 1898. He was born in Albany, New York, of English parentage, July 26, 1826; was educated in the schools of New York and at the University of the city, being graduated in 1844. He began the study of law, entered the Harvard Law School, where he remained but a short time, and went to New Orleans, continuing his law studies there and devoting some time to newspaper work. In 1846 he was admitted to the Louisiana bar and to the New York bar in 1848. His first party affiliation was with the Whigs; later he joined the Democrats and was three times elected District Attorney of New York, the first being in 1854. He was elected Mayor in 1868 and again in 1870. It was alleged that at this time he was implicated in the notorious "Tweed ring," which he certainly supported, but later he was acquitted of criminal implication in the affair. In 1875 he entered upon a dramatic career, which was of short duration, appearing in his own play, the *Crucible*, at the Park theatre. Later he was in the New York *World* office for a number of years, from 1883 to 1888 was London correspondent of the New York *Herald*, and in 1890 he returned to London for the New York *Journal*. In 1889 Mr. Hall brought suit for libel against Professor James Bryce, because of the chapter on Tammany scandals, written by Professor Goodnow of Columbia University, in Bryce's *The American Commonwealth*. The chapter was omitted in a subsequent edition. The case was dismissed in 1897 because Mr. Hall failed to comply with the court's order directing the plaintiff to give security for the defendant's costs of action. Mr. Hall had a remarkable career as lawyer, politician, and writer.

HALL, JAMES, LL. D., State Geologist of New York, died at Bethlehem, New Hampshire, August 7, 1898. He was born at Hingham, Massachusetts, September

12, 1811; was graduated in 1832 at the Rensselaer School (new Rensselaer Polytechnic Institute), Troy, New York; here for a number of years he conducted the department of geology. In 1837 he was one of the geologists appointed for the survey of New York State, and in the same year became State Geologist and Paleontologist. He was appointed State Geologist of Iowa in 1855 and of Wisconsin in 1857. He assisted in many of the scientific explorations under the United States government; among which were Fremont's expedition in 1845, Stansbury's to Great Salt Lake in 1852, Emory's United States and Mexican boundary survey in 1857, and the United States geological survey of the fortieth parallel in 1877. Dr. Hall published valuable reports on all of these expeditions. He was President of the American Society for the Advancement of Science, in 1856. The following year, at a meeting of the society in Montreal, he advanced the theory of mountain formation by sedimentation below sea level and subsequent elevation; this hypothesis, which he afterward developed, has become an accepted theory. He was said to be the founder of stratigraphic geology and applied paleontology in America, and was the first to show the value of mineralogical composition in determining crystalline rocks. Dr. Hall was one of the original members of the National Academy of Science, and one of the founders of the International Congress of Geology, at the meeting of which at London in 1897 he represented the geologists of New York State. In 1866 he became the director of the New York State Museum and for many years he had in charge the paleontological section of the State Cabinet of Natural History at Albany. His great work, *The Paleontology of New York*, is a standard authority; it consists of fourteen volumes, the first appearing in 1847 and followed at intervals by the others.

HALL, JOHN, D. D., the well-known Presbyterian clergyman of New York, died of heart failure on September 17, 1898, at the home of his sister, Bangor, county Down, Ireland, whither he had gone for rest. He was born at Market Hill, county Armagh, Ireland, July 31, 1829, of Scotch parentage, and at thirteen entered Belfast College, where he was distinguished for scholarship. Having been licensed as a preacher in 1849 by the Presbytery of Belfast, he labored as a missionary for three years in the west of Ireland; he then was installed as pastor of the First Presbyterian Church in Armagh, and six years later as pastor of a large church in Dublin. During his pastorate here the church built a fine new edifice in Rutland Square. At this time Dr. Hall not only was active in church work, but manifested much interest in popular education and other public affairs. He came to America in 1867 as a delegate from the General Assembly of Ireland to the Old School Presbyterian Assembly, and it is thought that the union of these two schools, which occurred soon after, was largely due to his influence. During this visit to the United States he was called to the pastorate of the Fifth Avenue Presbyterian Church, which is said to be the wealthiest in the denomination, and at the head of which he remained until his death. His congregation moved in 1874 to the large edifice at Fifth avenue and Fifty-fifth street. In January 1898, it was reported that there was some dissatisfaction in his congregation, whereupon Dr. Hall tendered his resignation; not being accepted, however, it was withdrawn by him. At the time not a little censure was laid upon the church, a part of which expressed its desire for Dr. Hall's retirement; but it was subsequently stated that this movement was actuated by most generous intentions toward Dr. Hall. Besides serving as a member of the International Sunday School Committee from 1872 to 1896, "he did a vast amount of work on committees and denomination boards, as trustee of Princeton University, director of Union Theological Seminary, lecturer at Yale, chancellor of the University of the City of New York, and in many other responsible positions." ●

According to the consensus of opinion Dr. Hall was neither a great orator nor a deep and original thinker, and yet it is agreed that he was a great preacher. Born in the Calvinistic faith, he never departed from its principles, but always maintained conservatism in belief and a fearlessness in expression. He was outspoken in his opposition to Dr. Briggs and others of that liberal school. Though pastor over a most fashionable parish, he always observed—both in the pulpit and out—a simplicity and directness of manner that were indicative of the man's real greatness and sincerity. The secret of his power doubtless lay in a spirituality and a religious enthusiasm that were both simple and honest. Among his publications are: *Family Prayers for Four Weeks* (1868); *Papers for Home Reading* (1871); *Familiar Talks to Boys*; *Questions of the Day* (1873); *God's Word Through Preaching* (1875); *Foundation Stones for Young Builders* (1880); *A Christian Home and How to Maintain It* (1883); *Light Unto my Path* (1895).

HAMILTON COLLEGE, at Clinton, New York, founded in 1812, is non-sectarian and for men only. On June 1, 1898, there were 37,921 volumes and 20,090 pamphlets in the library. There are forty-five scholarships and one fellowship. For the year 1898-99 the officers of instruction numbered 18; the students numbered: seniors, 46;

juniors, 35; sophomores, 33; freshmen, 42; total, together with one special student and one fellow, 158. At the commencement, June, 1898, the following degrees were conferred: in course, A. B., 26; B. Ph., 6; A. M., 11; A. B., *nunc pro tunc*, 6; A. M., *ex gratia*, 4, by examination, 1; honorary, A. M., 1; Sc. D., 1; D. D., 3; LL. D., 1. The whole number of alumni, including honorary degree men, is 2,887; the classical graduates number 2,257. The Root Hall of Science, given by Mr. Elihu Root and costing \$32,000, was formally opened in November, 1897; the same year the Hall of Languages, given by Mr. Henry H. Benedict, was completed. The latter is a building of the Romanesque style, and cost \$24,600. The total productive funds amount to about \$500,000, and the total income is about \$130,000. President, Melancthon Woolsey Stryker, D. D., LL. D. See UNIVERSITIES AND COLLEGES.

HANDEL AND HAYDN SOCIETY, a choral society founded in Boston, Mass., in 1815, to perform sacred music and introduce the works of Handel, Haydn, and other great composers. The first complete creation performed was *The Messiah* Dec. 25, 1818. Charles E. Horn was the first regularly chosen conductor (1847). He was succeeded by Charles C. Perkins, J. E. Goodson, G. J. Webb, Carl Bergmann, Carl Zerrahn, and Reinhold L. Hermann, the last-named in 1898.

HANDY, Major MOSES PURNELL, prominent American journalist died in Augusta, Georgia, January 8, 1898. Son of a Presbyterian missionary, he was born in Missouri in 1847, but was brought up and educated in Virginia. During the Civil War he served in the Confederate army on the staff of General Stevens, as a special courier, having the rank of lieutenant. He began his career as a newspaper writer with a series of articles describing his military experience, which appeared in the *New York Watchman*. In 1870 he received severe injuries in the collapse of the Virginia State capitol in Richmond. Previous to that time Major Handy wrote for the *New York Christian Observer* and the *Richmond Despatch*. As correspondent for the *New York Tribune* he went to Cuba in 1873, whence he reported the *Virginian* affair, and, returning to this country, he became editor-in-chief of the *Richmond Enquirer*. Having acted as commissioner from Virginia to the Centennial Exposition at Philadelphia in 1876, he secured successively positions as editorial writer on the *Times*, managing editor of the *Press*, and editor and proprietor of the *Daily News*. He won a great reputation in 1893 as director of the Department of Publicity and Promotion of the Columbian Exposition. He was managing editor of the *Chicago Times-Herald* during the presidential campaign of 1896. On July 27, 1897, President McKinley appointed Major Handy to the position of Special Commissioner of the United States to the Paris Exposition of 1900, in which office, he was succeeded by Mr. Ferdinand W. Peck (q. v.).

HARCOURT, Sir WILLIAM VERNON, British statesman, regarded after the death of Gladstone as the natural leader of the Liberals, resigned the leadership of that party in December, 1898. He was born on October 14, 1827; educated at Cambridge University and called to the bar at the Inner Temple. In 1868 he was returned to the House of Commons as a Liberal for the city of Oxford. He was elected professor of International Law in Cambridge University in 1869 and appointed Solicitor General in 1873, holding this office until the resignation of the Gladstone Cabinet in February of the following year. In 1880, when Mr. Gladstone returned to power, Sir William Harcourt was made Secretary of State for the Home Department and went out of office with his party in June 1885. In January 1886 he was again made Chancellor of the Exchequer, which office he assumed for the third time in August 1892, holding it until the fall of the Gladstone-Rosebery government in June 1895. In a letter in which he said he could not undertake in future the responsibility of the Liberal leadership he referred to the sectional disputes which divided the party and said that no man could consent to do so, either with credit to himself or advantage to the country. He felt that there was a lack of unanimity in the desire for his leadership. His resignation gave the Liberals much concern and the complications which followed it greatly encouraged their political enemies. The question of Liberal leadership was unsolved at the close of the year 1898. See the article GREAT BRITAIN (paragraphs on History).

HARDEN, WILLIAM DEARING, jurist and author, died at Savannah, Georgia, January 10, 1898. He was born at Athens, Georgia, January 15, 1837; was graduated at Princeton in 1856; studied law and upon the outbreak of the Civil War entered the Confederate service. He served throughout the war in Tennessee and Virginia, being advanced to the rank of lieutenant-colonel. After the war he practised law in Savannah and was Judge of the City Court for fourteen years. Judge Harden was also well known in New York law circles and was a member of many well-known societies and clubs. He was the author of a work on dogmatic religion and of many papers on historical subjects. In politics he was a "gold" Democrat.

HARDEN-HICKEY, Baron, known as the "Prince of Trinidad," committed suicide at El Paso, Texas, February 9, 1898. He was born in France, December

8, 1854, gained some reputation as an author and journalist, and from 1878 to 1888 edited the *Paris Triboulet*, a journal devoted to the cause of the Royalists. During the nine years that he held this position, he fought several duels, was involved in forty-two lawsuits, and incurred fines aggregating 300,000 francs. While on a trip around the world his ship ran ashore on the island of Trinidad, off the Brazilian coast. Here he remained, and in 1894 proclaimed himself king with the title of "James I." He obtained colonists, made laws, issued currency and postage stamps, and provided for the carrying of mails by establishing a navy of one vessel. In 1895 Great Britain seized the island, and thus ended his rule. The act, however, caused a diplomatic dispute between the British and Brazilian governments.

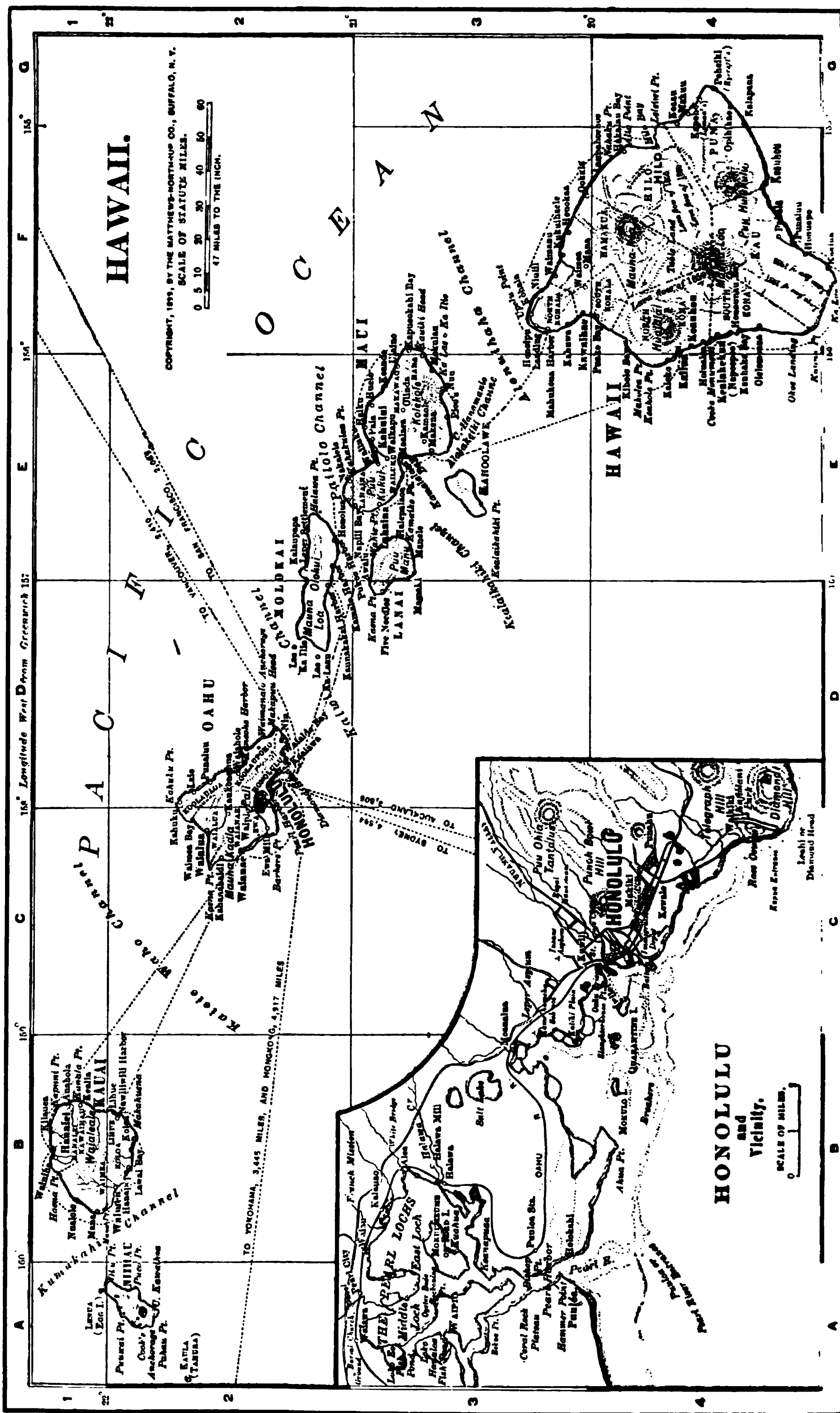
HART, ERNEST, D. C. L., M. R. C. S., was born in June 1836, and died January 7, 1898. He was educated at the City of London School and the medical school connected with St. George's Hospital; became ophthalmic surgeon and lecturer on ophthalmology at St. Mary's Hospital; was dean of the medical school, and for several years was co-editor of the *Lancet*. He did much to expose the unsanitary condition of the workhouses and was instrumental in bringing about the passage of "Hardy's Act" and the establishment of the Metropolitan Asylums Board. His reports on criminal baby farming in 1868 resulted in the Infant Life Protection Act; and later (1876) he assisted in establishing coffee taverns in London. From 1866 to the time of his death he was editor of the *British Medical Journal*. He was the author of numerous publications dealing largely with matters of workhouse sanitation, public health, etc. He also wrote *The Ancient Arts and Artists of Japan*. Mrs. Alice Marian Hart, widow of Dr. Hart, is a well-known English philanthropist.

HARVARD UNIVERSITY, at Cambridge, Massachusetts, non-sectarian; co-educational only in the summer schools; founded in 1836; comprehends the following departments to each of which is given the number of students for the academic year 1898-99: Harvard College, 1851; Lawrence Scientific School, 415; graduate school, 322; Divinity School, 26; Law School, 551; Medical School, 560; Dental School, 139; School of Veterinary Medicine, 25; Bussey Institution (school of agriculture), 23; total, deducting names inserted more than once, 3,901; the summer school of 1898 had an attendance of 759, making a total enrollment of the University 4,660. Officers of instruction number 411; President, since 1869, Charles William Eliot, LL. D. The degrees conferred at the commencement of 1898 were as follows: A. B., 391, out of course, 15; S. B., 29, out of course, 10; A. M., 102, out of course, 5; S. M., 5; Ph. D., 26; S. T. B., 3; LL. B., 130, out of course, 8; M. D., 124, out of course, 1; D. M. D., 36; M. D. V., 10; honorary, A. M., 3; D. D., 2; LL. D., 3. The libraries contain about 524,700 bound volumes together with about the same number of pamphlets, maps, etc. The Hemenway Gymnasium, with a floor space of about 30,000 square feet, is most excellently equipped, having lockers, dressing rooms, etc., for the accommodation of 2,500 students.

RADCLIFFE COLLEGE, at Cambridge, non-sectarian and for women only, was organized in 1879, as the Society for the Collegiate Instruction of Women ("Harvard Annex"), and was subsequently chartered under its present name. Students are instructed by members of the faculty of Harvard University; degrees are conferred with the approval of the president and fellows of Harvard College. The library contains 12,000 volumes, while the students are at liberty to use the Harvard library. For the academic year 1898-99, the officers of instruction numbered 96 and the students 411. The requirements for the degrees of Master of Arts and Bachelor of Arts are the same as for the corresponding degrees in Harvard University; the diplomas are countersigned by the President of Harvard and bear the University seal. See **PSYCHOLOGY, EXPERIMENTAL,** and **UNIVERSITIES AND COLLEGES.**

HASHISH. See **PSYCHOLOGY, EXPERIMENTAL** (paragraph Brown University).

HASKELL, JOSEPH T., Brigadier-General, U. S. V., died at Columbus, Ohio, September 16, 1898. He was born in Cincinnati, November 19, 1838. He entered the Union service and in 1863 was appointed a captain of volunteers and commissary of subsistence; he served through the war and was brevetted major, lieutenant-colonel, and colonel for meritorious services; was mustered out in 1866 and appointed a captain in the Twenty-third Infantry. In June 1872, he became major of the Twenty-fourth, and in August 1896, lieutenant-colonel of the Seventeenth. In 1869-72 he was in command in the San Juan islands, in regard to which there was a dispute between England and the United States. In 1888 he was made a member of the tactics board and assisted in compiling the tactics now used in the army; he was said to be one of the best tacticians in the service. From 1891 to 1898 he was president of the board of examiners of officers for promotion. At the outbreak of the war with Spain, when John S. Poland, colonel of the Seventeenth, was made a brigadier-general, Lieutenant-Colonel Haskell assumed command of the regiment and led it in the attack on El Caney July 1, 1898. He was seriously wounded and was carried from the field and sent to Fortress Monroe. On September 7 he was promoted



HAWAII.

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SCALE OF STATUTE MILES.
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17 MILES TO THE INCH.

HONOLULU and Vicinity.

SCALE OF MILES.
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brigadier-general for gallantry. He died suddenly after riding at the head of the Seventeenth when that regiment marched through Columbus.

HAVELOCK-ALLAN, Sir HENRY MARSHMAN, V. C., K. C. B., English general and Member of Parliament, was killed by the Afridis near the Khyber Pass on the Afghan frontier, December 30, 1897. He was the son of General Sir Henry Havelock, of Indian Mutiny fame, upon whom a baronetcy was conferred, but as he died before receiving it, the title was granted to the son. The addition of the name of Allan was due to the fact that a relative left him a legacy with that condition attached. He was born at Chinsurah, Bengal, India, August 6, 1830. On March 31, 1846, he obtained his commission as an ensign; in 1857 he served in the Persian expedition and as aide-de-camp to his father against the rebels in Oude. He was at Lucknow and Cawnpore and at the latter place won the Victoria Cross and was promoted to a captaincy. He soon became major and went under Lugard to put an end to the troubles in the Azimurh district. This was in October; in November he was ordered to take part in the Trans-Gogra campaign. At the end of the war in April 1859, he had been mentioned ten times in the despatches, had won a medal and two clasps, and had been promoted to the rank of brevet lieutenant-colonel. He fought in the Maori War, New Zealand, 1863-65. He was a Member of Parliament for Sunderland, 1874-81, and for Durham, 1885-92. He retired from military life in 1887, but in 1897 received the honorary rank of lieutenant-general, and was made K. C. B.

HAWAII, or **SANDWICH ISLANDS**, a chain of islands in the middle of the Pacific Ocean with an area of 6,640 sq. m. and a population according to the census completed in 1897 of 109,020, of which the most numerous element was the Hawaiian numbering 31,019. The Americans numbered 3,086. The capital is Honolulu (pop. 29,920) on the island of Oahu. The soil is very fertile and the chief products are sugar and rice, but coffee, hides, wool, bananas, whale oil and bone are also produced and exported in considerable quantities.

Commerce and Communications.—Steamers ply between the islands and the American continent, Australasia and China. There is a telegraph system comprising about 250 miles and a railway system of about 71 miles. In 1898 the total exports from the Hawaiian islands to all other countries were \$17,208,825 and the total imports were \$10,368,815. According to the Hawaiian official figures each of these totals is greater than was ever before reached in the foreign trade of the country. By far the largest share of this trade is with the United States. Of the exports from Hawaii in 1898 the United States received 99.44 per cent. and of the total imports to Hawaii the United States contributed 75.97 per cent.

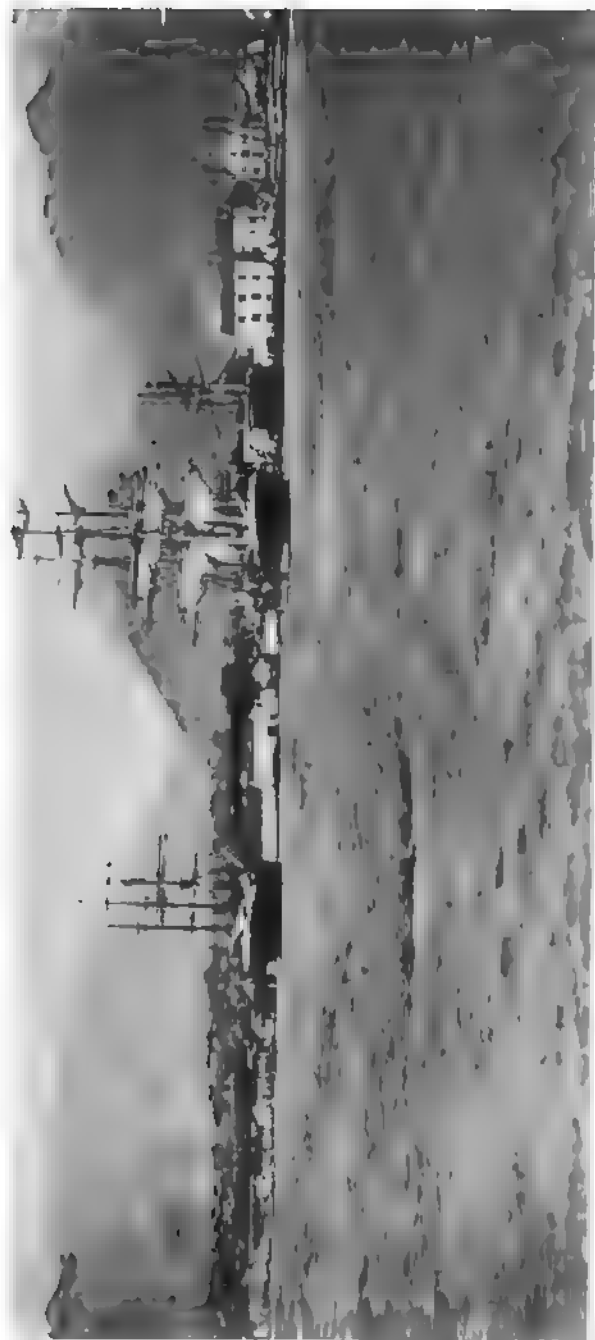
Finance.—In 1896 the taxes collected amounted to \$706,541, the tax per capita being \$6.48. For the year ending December 31, 1896, the revenue was \$2,383,070 and the expenditure \$2,137,103. The debt of the islands on June 30, 1896, was \$4,119,174.

Education.—The Hawaiian Islands out of a population of 109,000 have a school population between the ages of 6 and 15 inclusive, of 7,694 males and 6,592 females, a total of 14,286, about one-third of whom are Hawaiian and not quite a third are Hawaiian born, but of foreign parentage, Japanese, Chinese, Americans, British, German and Norwegian making up the greater part of the balance. There were in 1896 among the 595 teachers in the Hawaiian schools 177 American, 128 Hawaiian and part Hawaiian, and 66 British teachers, and the attendance upon the schools was: government schools 9,093 and independent or private schools 3,464. By the school law of 1896 the supervision of education is placed in the hands of the secretary of foreign affairs as head under him being six commissioners appointed by the President, the clergy of any denomination being excluded from appointment to this board. Attendance at some school is made obligatory for all children from 6 to 15 years of age. Private and independent schools are inspected by the government and instruction must be in the English language except by special permission. Co-education is legalized. The percentage of those above 6 years able to read and write was nearly 64, a very high figure when compared with most of the other nationalities of the world.

The Newlands Resolutions.—When Congress met in December, 1897, the Annexationists expected that the treaty providing for the annexation of Hawaii to the United States, which had been transmitted to the Congress by the President and had been ratified by the Congress of Hawaii, would quickly receive the required two-thirds vote in each house. They were, however, disappointed, for the debate continued until the latter part of March the annexation party seemingly losing strength. It was now seen that annexation could be made possible only by joint resolution. The attention of Congress was then transferred to the difficulties with Spain, and annexation was well-nigh a dead issue until the victory of Commodore Dewey at Manila brought more clearly to light American interests in the Pacific. On June 15, 1898, the Newlands Resolutions providing for annexation were adopted by the House by a vote of 209 to 91, and by the Senate, July 6, by a vote of 42 to 21. The vote by

parties in the House was: Affirmative, 179 Republicans, 18 Democrats, 8 Populists, and 4 Fusionists. In the Senate six Democrats voted in the affirmative and two Republicans in the negative. The following is a summary of the resolutions adopted: The preamble states the offer of the Hawaiian Republic to cede to the United States all of its sovereignty and absolute title to the government and crown lands. The offer is accepted and the islands declared annexed. The resolutions provided that the public debt of Hawaii, not to exceed \$4,000,000, be assumed, that Chinese immigration be prohibited, that all treaties with other powers be declared null, and that, until the Congress of the United States should provide for the government of the islands, all civil, judicial, and military powers then exercised by the officers of the existing government be exercised in such manner as the President might direct. It was further provided that the President appoint a committee of five, at least two of whom were to be resident Hawaiians, to recommend to Congress such legislation as might be deemed advisable. President McKinley, by whom the resolutions as well as the previously proposed treaty were warmly approved, signed the joint resolutions July 7, and the next day appointed the following committee: Senator Shelby M. Cullom, of Illinois; Senator John T. Morgan, of Alabama; Representative Robert R. Hitt, of Illinois; President Sanford B. Dole, of Hawaii; Justice W. F. Frear, of the Hawaiian Supreme Court.

Arguments on Annexation.—The more conservative element in the country objected to annexation at this time by joint resolution, first, because they held that a time of war is not favorable for giving a dispassionate and intelligent consideration to such a question; and, secondly, because they questioned the constitutionality of the measure declaring that annexation by joint resolution, without the conferring of statehood, was without precedent in the United States. The Congressional debates on the question were of a high order. The following is a brief statement of the annexationists' chief arguments. American influence was paramount in Hawaii, and by reason of this the government protected and fostered the people in industrial, social, and Christian enterprises; without annexation, however, this could not continue, because by the silent invasion of Asiatics the people would relapse into barbarism and even the confiscation of American property might result. Hawaii is a central point for telegraphic cables in the North Pacific and is of great strategic and commercial importance, it being asserted that with it we could defend our coast with a smaller navy. In reply to the question of constitutionality it was claimed that, if Congress has the right to appropriate money for the purchase of new territory, it has the right to accept new territory as a gift. Up to the time that Commodore Dewey shifted the interest in the war to the Philippines, little consideration had been given to the proposed annexation as a war measure, although Captain Mahan long before had pointed out the very great strategic importance of the islands. When it became necessary to send supplies and other reinforcements to Commodore Dewey, the Hawaiian government, in violation of the international laws of neutrality, permitted American ships to coal at Honolulu and to make that city a base of war and naval supplies. It has been claimed by some that had Hawaii maintained neutrality, the United States, in order properly and successfully to follow up Dewey's victory, would have been obliged to take Honolulu by force. An immediate appeal of Hawaii to all the nations of the world would have ensued and foreign complications resulting, the United States would have lost both the advantages already gained and the possibility of further success in the Pacific. The strategic advantage in this specific case and the great friendliness of Hawaii to our government, led to a change in public opinion, so that at the time of annexation, Congress had the support of a large majority of the people. Whether annexation will prove to have been a wise measure or not, it is fortunate that it was finally decided by a consideration of that phase of the question which was of real merit and significance. Previously the debate had been largely upon the "sugar question." Each side claimed that relations of undue friendliness existed between its opponents and the Sugar Trust. Those opposed to annexation said that the Trust favored it because it promised the continuation of a large supply of untaxed raw sugar; those who were in favor of annexation said that the Trust opposed it because some Hawaiian sugar could be consumed without going to the refineries, and that the admission at that time of raw sugar free of duty was agreeable to the trust, while the proposed admission of partly refined sugar free of duty would injure it. Still further opposition arose from the beet-sugar industry, which has been recently fostered in this country. It was claimed that annexation, bringing with it free Hawaiian sugar, would tend to destroy the beet-sugar interests. Hawaiian sugar for a number of years had been admitted free, and so it was proposed not only to defeat annexation, but to repeal the reciprocity treaty and thus gain a revenue of nearly \$8,000,000 a year. The entire sugar discussion was lost in the larger economic problem, and it is improbable that the Sugar Trust influenced many votes either one way or the other. The opponents of annexation said that it was unwise to divide our territory, to inaugurate in this country the principle of territorial expansion, or to admit a new territory "whose citizenship is so undesirable that it



THE HARBOR OF HONOLULU.

cannot be governed as a State and cannot be governed in any other way without throwing into confusion our political system." The majority of native Hawaiians, moreover, did not want annexation. It was further shown that annexation would require a larger rather than a smaller Pacific navy. While it is obvious that Hawaii rendered the United States immense service in the prosecution of the Philippine campaign, it is by no means certain that, without the islands, but with a greater number of cargo vessels, the campaign could not have been terminated with equal success. It was also claimed that from a commercial point of view annexation was unnecessary since our trade ships already had the privileges of Pearl harbor and since a reciprocity treaty already existed. The conservative press in general was unfriendly to annexation, and Speaker Thomas B. Reed opposed it to the last.

Annexation.—The members of the commission appointed by the President in July met at Honolulu on Aug. 25, and after spending several weeks in a study of conditions in the island returned to the United States on Oct. 1. In the meanwhile the ceremonies making the formal transfer of the sovereignty of the Hawaiian Republic to the United States had taken place. Aug. 12 was appointed as Annexation Day and the exercises were held in the grounds of the executive building at Honolulu in the presence of a great crowd composed chiefly of foreign residents. The United States Minister handed President Dole a copy of the Newlands resolution. The latter announced the formal cession of the sovereignty and public property of the Hawaiian Islands to the United States Minister as the representative of the latter government. The United States Minister then read President McKinley's proclamation that the administration of the government should be carried on in the same manner and by the same officials as before. Then followed the administration of the oath of allegiance to President Dole and his Cabinet, and the swearing in of the National Guards. Some discontent had in the meanwhile shown itself among the natives, who at a mass-meeting on Sept. 12, had declared that annexation could not be effected without the consent of the Hawaiian people, or of a representative Hawaiian legislature, and urged that the government of January, 1896, be restored. The last important act of the Hawaiian government was the payment of the sum of \$75,000 as an indemnity for damages sustained by the exclusion of Japanese laborers.

Proposed Form of Government.—The plan proposed by the commission for the government of Hawaii appears to combine features characteristic of both the Territorial and State forms of government in the United States. The President of the United States is to appoint the Governor, Secretary, District Judge, District Attorney, and Marshall of Hawaii, while the other officers in the Hawaiian government are to be appointed by the Governor with the consent of the Senate. Representative government in Hawaii is to continue on its existing basis with a Senate and House of Representatives. The property qualifications for Senators and Representatives are to be retained as well as the requirement that every voter must be of full age and able to speak, read and write either Hawaiian or English. The Constitution and laws of the United States, of course, are extended over Hawaii and when they come into operation will settle the question of Chinese immigration. In the meanwhile pending the action of Congress Chinese immigrants are excluded, it having been decided that the United States laws should apply at once to Hawaii in that matter.

The bill embodying the commission's proposals was reported with some changes by the Senate committee on Dec. 21, 1898. See LEPROSY.

Haweis, Mrs. (MARY E. JOY), an English woman well known in literary, philanthropic, and artistic circles, died November 28, 1898. She was born in London; travelled widely with her husband, Rev. H. R. Haweis, in America, Africa, and on the Continent. Although especially interested in antiquarian art, she did much by way of illustrating magazines and books and designing diagrams, covers, etc. At various times she placed on exhibition pictures in oil in the Royal Academy, Dudley Gallery, British Institution, etc. She was superintendent of the Mercy (animals) Branch of the British Woman's Temperance Association, vice-president of the Maternity Society of England, vice-president of the Central National Society for Women's Suffrage, and a member of the Society of Authors and of the Society of Women Journalists. In 1897-98 she was conducting a course in Chaucer in the National Home Reading Union (Victoria Embankment). Among her published writings besides regular journalistic work, are: *Tales from Chaucer*; *Chaucer's Beads* (birthday book); *Chaucer for Children*; *Chaucer for Schools*; *Art of Decoration*; *Art of Beauty*; *Art of Dress*; *Art of Housekeeping*; *Rus in Urbe, or Town Gardening*; *Beautiful Houses*. In 1897 she published a novel entitled *A Flame of Fire*.

HAWKINS, ANTHONY HOPE, author, born in London, Feb. 9, 1863. He is the son of the Rev. E. C. Hawkins, vicar of St. Bride's; took honors at Oxford; was called to the bar of London in 1894; and gave up its practice for literature. His books are characterized by imagination and wit. They include: *A Man of Mark* (1890); *Father Stafford* (1891); *Mr. Witt's Widow* (1892); *Half a Hero* (1893); *The*

Prisoner of Zenda (1894); *The God in the Car* (1894); *The Dolly Dialogues* (1894); *The Chronicles of Count Antonio* (1895); *Comedies of Courtship* (1896); *The Heart of Princess Osra* (1896); *Phroso* (1897); *Simon Dale* (1898); and *Rupert of Hentsall* (1898). *The Adventure of Lady Ursula* was played successfully in England and America in 1898.

HAWKINS, Major-General HAMILTON S., distinguished himself in the battle of San Juan hill in the Spanish-American War (q. v.). At the beginning of the war he was colonel of the 20th Infantry, but was commissioned as brigadier-general of volunteers, and after San Juan was raised to the rank of major-general of volunteers. In September he was appointed to the regular army with the rank of brigadier-general, but was retired from active service on account of age in the following month.

HAY. The following table published by the Department of Agriculture shows the acreage, production and value of hay in the United States, in 1898:

States and Territories.	Acres.	Production. Tons.	Value.
Maine	986,715	1,184,058	\$8,998,841
New Hampshire	614,385	767,981	7,103,824
Vermont	869,314	1,260,505	8,004,207
Massachusetts	602,762	855,922	10,356,656
Rhode Island	75,266	88,814	1,123,497
Connecticut	470,774	616,714	6,876,361
New York	4,585,330	6,419,462	36,911,906
New Jersey	404,321	574,136	5,511,706
Pennsylvania	2,609,668	3,784,019	29,893,750
Delaware	51,945	71,684	605,730
Maryland	294,783	353,740	3,289,782
Virginia	545,513	720,077	6,120,654
North Carolina	131,844	224,135	2,084,456
South Carolina	148,819	238,110	2,262,045
Georgia	113,841	199,222	2,340,858
Florida	6,255	10,008	141,113
Alabama	53,029	100,755	931,984
Mississippi	56,600	107,540	903,336
Louisiana	25,923	54,438	511,717
Texas	314,299	471,448	2,757,971
Arkansas	140,247	215,980	1,457,865
Tennessee	276,532	414,798	3,940,581
West Virginia	509,182	784,140	6,586,776
Kentucky	340,192	493,278	4,488,830
Ohio	1,764,846	2,453,136	14,105,532
Michigan	1,423,964	1,936,591	13,846,626
Indiana	1,644,443	2,384,442	13,352,875
Illinois	2,037,649	3,178,732	18,754,519
Wisconsin	1,504,884	2,257,326	12,979,624
Minnesota	1,530,142	2,754,256	10,190,747
Iowa	4,518,948	7,908,159	32,028,044
Missouri	2,236,319	3,578,110	20,753,038
Kansas	3,188,367	4,655,016	15,128,802
Nebraska	2,014,612	3,223,379	10,637,151
South Dakota	1,924,444	2,655,733	7,967,199
North Dakota	376,518	564,777	1,835,525
Montana	348,003	504,604	3,431,307
Wyoming	247,237	484,585	2,819,052
Colorado	800,331	1,760,728	9,507,931
New Mexico	39,495	148,106	1,088,579
Arizona	33,282	116,487	1,397,844
Utah	188,681	613,213	2,759,458
Nevada	155,921	405,395	2,837,765
Idaho	201,830	756,862	3,708,624
Washington	300,786	526,376	4,000,458
Oregon	612,683	1,164,098	8,439,710
California	1,459,903	2,335,845	33,285,791
Oklahoma .....	.....	.....	.....
Indian Territory .....	.....	.....	.....
Total	42,780,827	66,376,920	\$398,060,647

HAY, Colonel JOHN, became Secretary of State in the McKinley Cabinet, September 30, 1898. The announcement that Judge William R. Day, who resigned his position as Secretary of State to become the head of the Peace Commission which met in Paris, October 1, 1898, would be succeeded by Colonel Hay, received popular approval, both Republicans and Democrats with few exceptions recognizing Colonel Hay's ability and integrity. No one of the thirty-seven secretaries of state who preceded him had a better diplomatic training than Secretary Hay. He was born on the 8th day of October 1838, at Salem, Indiana, and in 1858 was graduated and unusual literary ability. He was a healthy, sturdy young man both in mind and body, was genial and cordially inclined to all who knew him;—all of which characteristics have remained with him through life and have in no small degree contributed to his popularity and real success. On leaving college it is said that his "shrewdness drew him to the law, while his sentiment was trying to draw him to literature," and within a year after graduation he was introduced by his uncle, Malcolm Hay, to Abraham Lincoln, into whose law office he went as a student, and with whom, notwithstanding the disparity of their ages, he developed a strong friendship. Mr. Hay had just been admitted to the bar when, as one of Lincoln's private secretaries, he accompanied the President-elect on the memorable journey to Washington. Here for the greater part of four years he served Lincoln with patience, shrewdness, and ability. He knew intimately the great men of that time and has been on terms of friendship with most of the important leaders, in his own party at least, from that time to this. He gained his title of colonel by serving several months in the field under Generals Hunter and Gillmore. His real diplomatic career began with his appointment as Secretary of Legation at Paris. He was successively Secretary of Legation at Vienna and Madrid, and repeatedly assumed the position of Chargé d'Affaires. In 1870, the year in which his *Pike County Ballads* appeared, having returned to America, he became a member of the editorial staff of the New York *Tribune*, which position he held for five years. He served with peculiar success as Assistant Secretary of State during the last two years of President Hayes's administration, and in 1881 he also acted as President of the International Sanitary Congress in Washington and directed the editorial page of the *Tribune* during the absence of the editor, Mr. Whitelaw Reid. From this time until the inauguration of President McKinley, by whom he was appointed Ambassador to the Court of St. James, the public heard but little of him either in the realm of diplomacy or politics. It is said, however, that he has been constantly an active, though comparatively a silent, political force. His integrity, his scholarship and oratory, his strength and urbanity won for him in London the confidence and admiration of the English people. Probably none of his predecessors at St. James have been quite so successful as he in preserving that poise, so difficult for American diplomats, where firmness and determination does not become rudeness and politeness does not sink into the fulsome. His duties were discharged both with wisdom and grace, and his new duties as Secretary of State were begun September 30th with all the advantages which a long diplomatic career, a special knowledge of English affairs, and the good will of the English people could give. It was remarked by many that Colonel Hay's appointment was significant, coming as it did, at a time when "Anglo-Saxon Unity" and even "Anglo-American Alliance" were themes of great prominence; for he was greatly in favor of closer feelings of friendship between the two nations.

As a man of letters Colonel Hay is well known. His *Castilian Days*, published in 1871, is the result of his two years of observation in Madrid, and is said by many to be the best book of its kind on Spain. While historical and accurate in detail, it is full of romance and possesses the true Spanish coloring and atmosphere. Among his other prose works are the *Breadwinners* and the *Life of Lincoln*, the latter written in collaboration with Mr. John G. Nicolay and accounted the best biography of the great war President. Upon this work Colonel Hay spent about ten years. He is well known as a writer of lyric verse though his production has not been large. In the same year that *Castilian Days* appeared, he also published his *Pike County Ballads*, which immediately achieved popularity, but only two of which—*Jim Bludso* and *Little Breeches*—seem destined to anything like lasting fame. Besides the *Ballads*, Colonel Hay has written verses of considerable grace and beauty; among them are *On the Bluff*, *Night in Venice*, *A Woman's Love*, and *The Prairie*.

In 1875 Colonel Hay married one of the daughters of Amasa Stone, the railroad magnate of Cleveland, in which city the colonel and his wife took up their residence. For the last dozen years Washington has been their residence. They have two daughters.

HAYTI. See HAITI.

HEALTH RESORT ASSOCIATION, AMERICAN. The object of this association is to ascertain facts regarding climates, health resorts and mineral waters for the

guidance of medical men. Next annual meeting at Chicago, Ill., in June, 1899. President, J. F. Danter, M. D., 41 Murray street, Toronto, Ont., Canada; Secretary, W. A. Chatterton, 78 Maiden Lane, N. Y.

HEATSTROKE. Sambon, of Rome, published in March 1898, a paper on siriasis, or heatstroke, in which he asserts the infectious character of the disease as produced by a specific germ. He cites the geographical distribution, the endemicity, the very definite lesions, the occurrence of epidemics, the character of the symptoms and the liability to relapse. He classes it with yellow fever, dengué, and other tropical affections, germ diseases requiring high atmospheric temperature. This view has yet to be substantiated. Alexander Lambert, of New York, published in 1897 a review of the cases of heatstroke occurring in the unprecedented season of 1896 in that city. During the week ending August 15, 1896, there were 1,810 deaths reported, of which 648 were deaths from sunstroke, or heatstroke. During the ten days between August 4 and 14, the temperature in the shade registered between 72° and 98° F. For five consecutive periods of twenty-four hours, August 7 to August 12, (except from 3 to 5 A. M. August 8) the temperature ranged from 80° to 98° F., the mean temperature being 86.7° F., or 10.6° F. higher than the monthly mean, and 12.8° F. higher than the mean of the other twenty-one days of August. The temperature in the sun, during the working hours of the day, from 8 A. M. to 5 P. M., averaged 119.3° F., ranging from 94° to 137° F., and after sunset the temperature fell but little below 90° F. till nearly midnight. During the hot ten days but two slight showers of rain fell, between 11 and 12 P. M., August 7 and 9. Many patients died before reaching hospitals, or in their homes. Seventy-two patients were classed as cases of heat prostration, 38 as cases of an asphyxial form of heatstroke, and 520 as hyperpyrexial cases, or true cases of intense heatstroke. In the 246 cases of hyperpyrexia reaching hospitals in which the temperature was taken on admission, the thermometer registered from 105° to 117.8° F., the pulse ranged from 96 to 180, and the respiration 16 to 64. The majority of the cases occurred between 2 and 5 P. M., of those stricken while at work, and between 7 and 10 P. M., of those who went home to eat hearty meals and drink beer in the vitiated and overheated atmosphere of tenements. Bakers and firemen succumbed in the middle of the night. The ice bath (composed of water at 70°, cooled down to 40° by pieces of ice put into the tub, the patient being rubbed while in the bath, and the patient's temperature being brought down to 102.5°) or the fine needle spray of water at 75°, until the temperature was reduced to 103°, proved the most beneficial treatment. Van Gieson, director of the Pathological Institute of the New York State Hospitals for the Insane, found changes in the chromophilic plaques of the ganglion cells of the brain. These plaques were changed in shape, fewer in number, replaced by fine dust or entirely absent. The nucleus of the brain cell stained very deeply, and within the nuclear membrane were found minute spherical granules not normally present. Van Gieson says: "There seems to be no other interpretation open as to the significance of this degeneration than the operation of a toxic substance upon the ganglion cells. . . . There is in insolation a toxic cytolysis or cell resolution of the neurons." He considers the morphologic changes in the ganglion cells similar to those produced by alcohol, lead, and the microbial poisons; and that heatstroke is "a species of auto-intoxication, the neural symptoms finding a clear and definite explanation in the acute parenchymatous degeneration induced by an autogenous poison."

Two and six-tenths per cent. of the heat produced by the chemic metabolism within the body is lost from the body in warming substances taken in as food and drink, 2.6 per cent. in warming the inspired air, 14.7 by evaporation, and 80.1 per cent. by radiation and conduction from the skin. With the inspired air hotter than the body, radiation and conduction abolished, and evaporation rendered impossible in an atmosphere nearly saturated with vapor, the constant production of heat by muscular action must result in a great strain upon the inhibitory cerebral centres that preside over heat regulation. Any previous ill health, alcoholic indulgence or other excess is followed by a failure of these centres under such strain and heatstroke is the result. The combined influence of heat and auto-intoxication must be the cause of heatstroke, with the possibility of a germ poison.

HEINE MEMORIAL FOUNTAIN. See SCULPTURE (paragraph Exhibitions).

HELIUM. Professor Dewar has been able to liquefy helium. He placed some purified helium in a glass tube with a bulb and plunged it into liquid hydrogen, whereupon a distinct liquid was found to condense. From this experiment it is evident that there are but few differences in the boiling points of hydrogen and helium.

HEMATITE. See IRON AND STEEL, also ALABAMA.

HENLEY, WILLIAM ERNEST, poet and essayist born in Gloucester, England, Aug. 23, 1849. He received his LL. D. from St. Andrews. He has been editor of the *Magazine of Art* of the *Scots Observer*, and is now editor of the *New Review*, Lon-

don. His work, refined in style and very literary in quality, includes: *Views and Reviews* (1890); *Song of the Sword* (1892); *English Lyrics* (1897); *Poems* (1898); and *London Types* (with W. Nicholson, 1898).

HENRY, LIEUTENANT COLONEL, whose confession and death have been described in the account of the Dreyfus affair (see FRANCE), was formerly chief of the intelligence department in the French War Office. His duties in the War Department brought him into connection with the original proceedings in the Dreyfus case in 1894. He was a witness in the first Zola trial, and having advanced some testimony which conflicted with that of Col. Picquart, called the latter a liar. The result was a duel in which Henry was wounded. He was the forger of the third document referred to in the speech of M. Cavaignac, and his confession and death proved the worthlessness of this portion of the documentary evidence. He is said to have been a plain and somewhat illiterate soldier, sincere in his conduct, but with a most exalted idea of his devotion to his chiefs. He is regarded by some as a tool of those higher in authority, and as having acted from mistaken but disinterested motives. From the carelessness of the authorities in leaving a razor in his cell, it was suspected that they intended to connive at his suicide, a suspicion which was strengthened by the revolver episode in the Dreyfus affair.

HENRY, General Guy V., was born at Fort Smith, Indian Territory March 9, 1839, and graduated at the West Point Military Academy in 1861. He served through the Civil War, at the close of which he held the brevet rank of colonel in the regular army and of brigadier-general of volunteers. Retaining his commission in the regular army he rose to the rank of colonel of the 10th Cavalry. On May 4, 1898, he was made brigadier-general of volunteers. He was in command of a brigade in the expedition of General Miles to Puerto Rico and his conduct there won high praise. In October he was appointed brigadier-general in the regular army. Appointed Military Governor of Puerto Rico he entered upon his duties at San Juan in December 1898. See the article PUERTO RICO.

HEPTASOPHS. IMPROVED ORDER, a fraternal society founded in 1878, has 529 conclaves and 42,359 members. Since its organization it has disbursed \$3,220,400 and in its last fiscal year \$651,000. M. G. Cohen, Pittsburgh, Pa., is Supreme Archon, and Samuel H. Tattersall, Baltimore, Md., Supreme Secretary.

HEREDITY. See BIOLOGY (paragraph Heredity).

HERSCHELL, First Baron (created 1886), FARRER, G. C. B., D. C. L., LL. D., chairman of the Anglo-American Commission. (See CANADA) created in May 1898, by the British and American governments, was born November 2, 1837. He was educated at the universities of Bonn and London, receiving his B. A. at the latter institution with classical honors; became barrister of Lincoln's Inn, 1860; Queen's Counsel and Bencher of Lincoln's Inn, 1872, and was recorder of Carlisle, 1873-80. From 1874 to 1885 Mr. Herschell was Liberal M. P. for Durham City, and Solicitor-General from 1880 to 1885; in 1886 and 1892-95 he was Lord High Chancellor, and in 1890 received the appointment of Warden of the Cinque Ports. He was a member of the arbitration board appointed to settle the Anglo-Venezuelan boundary dispute.

HERZ, CORNELIUS, a physician and scientist who became notorious for his connection with the Panama canal scandal of 1888, died at Bournemouth, England, July 6, 1898. He was born at Besançon, France, September 3, 1845. In 1864 he received the degree M. S. at the College of the City of New York; studied medicine at Paris and Heidelberg. For his service as a surgeon in the Franco-Prussian War he was decorated with the cross of the Legion of Honor. He subsequently became prominent in San Francisco, California, and in Paris, through his work in electricity. When the Panama scandal was brought before the Parisian Court, he was accused of implication and thereupon fled to England. Unsuccessful attempts were made to extradite him; although absent he was condemned and his property confiscated.

HERZEGOVINA. See BOSNIA AND HERZEGOVINA.

HEWLETT, MAURICE HENRY, author, born in London, Jan. 22, 1861. He was educated in London, was called to the bar in 1891, and has been Keeper of the Land Revenue Records and Enrolments since 1896. His great success was attained in 1898 by *The Forest Lovers*, a romantic novel. His other books are: *Earthworks Out of Tuscany* (1895); *The Masque of Dead Florentines* (1895); *Songs and Meditations* (1897); and *Pan and the Young Shepherd* (1898).

HIBERNIANS OF AMERICA, ANCIENT ORDER OF, a fraternal society founded in 1836, has now 1,498 divisions and 105,383 members. During its last fiscal year this society disbursed \$228,941. National President, J. T. Keating, Chicago, Ill., and National Secretary, James O. Sullivan, Philadelphia, Pa.

HIERAKONPOLIS. See ARCHÆOLOGY (paragraph Egypt).

HILDESHEIM, TREASURE. See ARCHÆOLOGY (paragraphs Switzerland and Germany).

HILL, DAVID JAYNE, LL. D., ex-President of Rochester University, was appointed by President McKinley, October 3, 1898, to the position of Assistant Secretary of State, made vacant by the resignation of Professor John B. Moore, who acted as secretary of the Paris Peace Commission. Born in Plainfield, New Jersey, June 10, 1850, Mr. Hill was graduated from Bucknell University, Lewisburg, Pennsylvania, with the class of 1870. After serving as professor of rhetoric in, and subsequently (1879) as President of, his *alma mater*, he accepted a call to the Presidency of the University of Rochester, which position he held from 1889 to 1896. His predecessor was Martin B. Anderson. Besides his essays on *The Principles and Fallacies of Socialism*, he has written several text-books on rhetoric, literature, and psychology. Mr. Hill is a thorough student and broad-minded scholar, he has good executive abilities, and in several political campaigns in which he recently took part he has shown himself to be a careful observer of practical affairs. The appointment gave general satisfaction and seemed to show, as one journal pointed out, "the President's liking for men of studious habits for diplomatic work."

HISTOLOGY OF PLANTS. See BOTANY (paragraph Histology and Morphology).

HISTORICAL ASSOCIATION, AMERICAN, organized in 1884 and incorporated in 1889, for the promotion of historical studies, has a general committee representing the association in various states and cities for historical purposes; a committee for promoting the study of history in secondary schools; a commission for the historical study of colonial dependencies; a commission for the preservation and publication of important manuscripts, and preserves historical collections in the national museum. The society publishes an annual *Report* and the *American Historical Review* (quarterly). The society meets annually. In 1898 there were over 1,200 members. President, James Ford Rhodes, LL. D. At the annual meeting, December 28-30, at New Haven, *The American Historical Review* was formally adopted, an annual subsidy of \$2,400 being voted.

HITCHCOCK, ETHAN ALLEN, Secretary of the Interior, was born at Mobile, Alabama, in 1835. He is the great grandson of Ethan Allen, of Ticonderoga fame. Mr. Hitchcock went to St. Louis in 1851, engaging in business there until 1860, when he went to China, to represent certain business interests. In 1874 he returned to St. Louis, becoming president of a number of manufacturing and railway corporations, including the Crystal Plate Glass Company, of Crystal City, Missouri. He and President McKinley became friends when the latter as chairman of the ways and means committee of the House conferred with him regarding the making of tariff schedules on glass. In August, 1897, he was appointed minister to Russia and was subsequently raised to the rank of ambassador when Russia established an embassy at Washington. On December 21, 1898, Mr. Hitchcock was nominated and confirmed Secretary of the Interior to succeed Mr. Cornelius N. Bliss, resigned.

HITCHCOCK, LUKE, D. D., a well-known Chicago clergyman in the Methodist Episcopal Church, died at East Orange, New Jersey, November 12, 1898. He was born at Lebanon, New York, in 1812. Leaving his native town he went to Chicago where he became prominent in church work. For about twenty years he was a member of the firm of Hitchcock & Walden, of Cincinnati, Ohio, publishers of church literature.

HITCHCOCK, WILLIAM A., D. D., Protestant Episcopal clergyman, died in New York City, February 10, 1898. He was born in New Haven, Connecticut, January 25, 1834; was graduated at Trinity College, Hartford, and the Berkeley Divinity School, and was ordained priest in 1857. During the Civil War he was a chaplain, and, it is said, prepared for confirmation the first class ever confirmed on a schoolship. As rector he was at various times at Elmira, Binghamton, and Batavia, N. Y., and at Pittsburg, Pa.

HOAR, SHERMAN, lawyer, died at his home in Concord, Massachusetts, October 7, 1898, of typhoid fever, probably contracted while aiding the Massachusetts Volunteers in camp at Montauk, Long Island. He was born at Concord, July 30, 1860, and was the son of the late Judge Ebenezer Rockwood Hoar; was educated at Phillips Academy, Exeter, and at Harvard College, at which he was graduated in 1882; studied law at the Harvard Law School and was admitted to practice in 1885. The next year, as a Democratic candidate for the State Senate, he was defeated; in 1890 was sent to Congress from the fifth district and at the expiration of his term was appointed by President Cleveland United States District Attorney for the Boston district. He was a "sound money" Democrat.

HOBSON, RICHMOND PEARSON, assistant naval constructor, U. S. N., was born at Greensboro, Alabama, August 17, 1870; was educated at the Southern University in

his native town, and entered the Naval Academy at Annapolis in 1885, being graduated four years later. He was assigned to the flagship *Chicago* and cruised in the Mediterranean and in South American waters until 1890, when he was ordered to a course in construction at Paris. He spent one year at the Ecole Nationale Supérieure des Mines and two years at the Ecole d'Application du Génie Maritime, returning to the United States in December, 1893. While abroad in July 1891, he was appointed assistant naval constructor. Subsequently his work in the Navy Department resulted in a paper entitled *Report on Disappearing Guns Afloat* and a work in six volumes entitled *Report on Information Gathered Abroad by Students*. He served for a time at the New York navy yard. On June 3, 1898, he with seven men sank the collier *Merrimac* in the channel of the harbor of Santiago de Cuba. See SPANISH-AMERICAN WAR.

HOLLAND DAMES OF THE NEW NETHERLANDS, a patriotic woman's society, has now several State organizations and an auxiliary of men of Dutch ancestry called Knights of the Legion of the Crown. Queen Lavinia H. Van Westervelt Dempsey; Secretaries, Mrs. W. H. Trafton, and Mrs. H. A. Topham.

HOME CIRCLE, a fraternal society founded in 1879, has 3 grand councils, 215 sub-councils, and 6,456 members. Since 1879 this society has disbursed \$1,754,000 and during its last fiscal year \$154,000. Supreme Leader, William E. Wood, Utica; Secretary, Julius M. Swain, Boston, Mass.

HOMEOPATHIC OPHTHALMOLOGICAL AND OTOLOGICAL ASSOCIATION, AMERICAN. Next annual meeting at Atlantic City, N. J., in June 1899. President, E. J. Bissell, M. D., Rochester, N. Y.; Secretary, H. D. Schenck, M. D., 241 McDonough street, Brooklyn, N. Y.

HONDURAS, a Republic of Central America comprising fifteen Departments, whose aggregate area is about 43,000 square miles, and whose population in 1895 was about 400,000. Only a very small portion of the population is of pure European descent, most of the inhabitants being Indians; there are also mixed races and a few negroes. The capital is Tegucigalpa (pop. 12,600). Amapala is the chief Pacific port; on the Atlantic are Omoa, La Ceiba, Puerto Cortez. There is complete religious toleration, but Roman Catholicism is the prevailing faith. Instruction is secular, free, and obligatory. There are a number of colleges and about 683 schools with 23,767 pupils.

Government.—The Republic was established in 1839. By the charter of 1894 the chief executive authority is vested in a President elected for four years by popular vote; he is assisted in the administration by a council comprising the following departments: The Interior, Public Instruction and Justice, Finance, War, Public Works. The President for 1895-99 is Don Policarpo Bonilla. The legislative power devolves upon a Congress of Deputies, the proportion being one deputy for each 10,000 inhabitants. The active army numbers 500 and the national guard 20,000. In 1896 Honduras, Nicaragua, and Salvador formed the Greater Republic of Central America. See CENTRAL AMERICA.

Finance.—Revenues and expenditures in pesos are reported for fiscal years ending July 30:

	1892	1895	1896
Revenue	1,764,137	2,172,760	1,901,606
Expenditure	2,603,650	1,248,811	2,264,586

The chief source of revenue are customs and taxes on alcoholic liquors and tobacco. In July 1897, the external public debt, with arrears, amounted to £16,908,164 (\$82,142,858); the internal debt (1896) was about 6,000,000 pesos (\$2,616,000). The peso is worth (October 1898), \$0.436 United States currency.

Industries and Commerce.—The chief industry is agriculture, and in this the cultivation of bananas has first place. Other products of some importance are sugar, tobacco, coffee, and maize. Much attention is given to the breeding of cattle. The mineral deposits of Honduras are very rich—probably the richest of any Central American State. They include gold, silver, platinum, copper, zinc, antimony, lead, nickel, and iron; these are found in almost every Department. There are about seventeen mining companies of importance, but little is accurately known of their output. The annual amount of gold washings is estimated at from \$150,000 to \$250,000. The foreign trade is chiefly with the United States. The total exports for the fiscal year 1896 amounted to 3,125,000 pesos, the imports to 1,322,418 pesos. The chief exports are precious metals, coffee, cattle, bananas, tobacco. In 1894 there entered Puerto Cortez 117 vessels of 71,022 tons.

Communications.—A railway extends from Puerto Cortez through San Pedro Sula to La Pimienta, a distance of 60 miles, and other roads have been projected. In 1896 the telegraph lines aggregated 2,667 miles, and the telegraph offices numbered 150. There are about 240 post-offices. On March 31, 1898, it was announced by the United States Consul at Tegucigalpa that the Congress of Honduras had granted to John E.

Wood and associates, of Cleveland, Ohio, the right to open up the Patuca river. According to the contract the company is to open a channel, to build appropriate wharves, etc., and to maintain a steamboat line to a point 150 miles from the mouth of the river. The company is to receive all wharfage dues and have the exclusive right of navigation in the river for ten years, and besides having preferences for railroad construction, etc., in that section, it shall also be granted the title to 100,000 hectares (247,110 acres) of national land. It is thought that this enterprise, which will open up the richest part of Honduras, will contribute greatly to the permanent prosperity of the country.

HONG KONG is a British island off the southeastern coast of China near the mouth of the Canton river with an area of 32 square miles, and a population, according to the census of June 1897, of 236,382, exclusive of the military and naval establishments. The capital is Victoria, commonly known as Hong Kong. The island is not productive, but is strongly fortified and forms an admirable warehouse. The colony's trade is active and has increased perceptibly since the opening of the West river to the important trading centre of Wuchow. The channel of this stream drains one of the richest sections of southern China, and by the opening of communication with Wuchow, England has secured for herself a very profitable trade. The local industries of Hong Kong, especially the sugar refining, have rapidly increased in recent years. Land is in great demand both for industrial and residential purposes. In the adjoining region silk, cassia, camphor wood, teas, sugar, tobacco, the fan palm, China grass, and fruits are produced. The administration is in the hands of a governor with an executive and legislative council. Besides being the chief center of British trade with China, it is a naval and military station of the first rank. By the Convention of June 9, 1898, the territories of the mainland were leased to Great Britain for 99 years, comprising an area of about 200 square miles. The effect of this is greatly to strengthen the defenses of the colony. See the article CHINA.

HOPE, ANTHONY. See HAWKINS, ANTHONY HOPE.

HOSPITAL, ROMAN. See ARCHÆOLOGY (paragraphs Switzerland and Germany).

HOWARD, BLANCHE WILLIS (Frau von Teuffel), American author, died at Munich, Germany, October 7, 1898. She was born in Bangor, Maine, July 21, 1847; removed to Stuttgart in 1878 and edited a magazine published in English. She married in 1890 Dr. von Teuffel, consulting physician to the King of Wurtemberg. Miss Howard's work has especially dealt with New England life, but also includes sketches of travel; in the latter she shows a liking for the European despotisms. Among her writings are: *One Summer*, 1875; *One Year Abroad*, 1877; *Aunt Serena*, 1880; *Guenn*, 1882; *Aulnay Tower*, 1886; *The Open Door*, 1889; *No Heroes*, 1893; *Tony the Maid*; *Seven on the Highway*, 1897.

HUGUENOT SOCIETY OF AMERICA, organized in 1883 of people of Huguenot descent. Headquarters, 105 East 22nd street, New York. President, Frederic J. de Peyster; Secretary, L. McL. Luqueer.

HUMANE ASSOCIATION, AMERICAN, is composed of 292 societies, comprising the "Children's," "Animals," and "Humane" societies throughout the United States and Canada. It held a meeting in Washington, D. C., December 14-16, 1898, at which 61 delegates were present. The report of the New York Society for the Prevention of cruelty to Children (q. v.), says: The Children's cause seemed to be progressing very favorably throughout all the English-speaking parts of the Continent, new organizations being formed during the past year, new laws secured, and above all, the mutual relations existing between these Societies, productive of valued co-operation, seemed to be very cordial. The representatives from localities other than those in the State of New York gave a hearty welcome to the delegations from this State, and particularly to that from the parent society.

HUNGARIAN LITERATURE. The past year has witnessed a good deal of literary activity in Hungary, especially in historical writings which received a fresh impetus from the jubilee of the Revolution of 1848. Of these may be mentioned *The History of the Struggle for Independence*, in five volumes, by György Gracza; 1848, by Jókai-Bródy; and *Magyardom under the Arpads*, by Gyula Lánchy. An interesting volume bearing upon the origin of the Magyars is *Travels in the Caucasus*, by Count Jenő Zichy, who has headed several expeditions to that region.

Biography.—The noteworthy biographies of the year are a two-volume life of Count Stephen Széchenyi, "the greatest of the Magyars," by Antal Zichy; those of two well-known Hungarian artists, *The Life and Works of Michael Munkácsy*, by Dezső Malonyay; and *Károly Markó*, by Tamas Szana; and a short but valuable account of the celebrated novelist, Maurus Jokai, written by Jozsef Szinnyi.

Fiction.—The most successful novels of the year are *The Dawn is Sure to Come*, by Gyula Werner, and *The Immigrants*, by a new writer who uses the pseudonym

of Mrs. Szikra. The first is a picture of contemporary life in Transylvania; the second is a satire upon the pretensions of the Hungarian middle class, "immigrants" attempting to intrude into the circle of the highest aristocracy. Among short stories should be mentioned *The Fairy Ilona*, by Sándor Bródy, one of the principal figures among the writers of Young Hungary; *Clouds*, by István Petelei; *The Merry World*, by István Barsony; and *Under the Poplars*, by István Tömörkény, who depicts in a masterly way many of the fast vanishing customs and habits of national life.

HUNGARY, the eastern part of the dual monarchy of Austria-Hungary, has an area of 125,039 square miles, with a population in 1896 of 18,550,512, comprising besides Hungary proper, Croatia-Slavonia, and Transylvania. The capital is Budapest with a population in 1890 of 500,384. In the main it is an agricultural country though primitive methods of cultivation are employed. Nearly 44 per cent. of the surface is arable and garden land, and nearly 30 per cent. is covered by forests, which are especially abundant in all the hilly regions. Grain in excess of what is needed for home consumption is produced, and includes the following crops in the order of their importance; wheat, maize, oats, barley and rye. In its mineral resources Hungary is one of the richest countries in the world. The chief means of communication is by the navigable rivers and canals, which have a total length of over 3,000 miles. The railway mileage at the beginning of 1896 was 8,375, 4,766 belonging to the state. It was reported in 1890 that over half of the population could neither read nor write, but since that time the progress of education has been considerable. In 1896 there were in Hungary 18,235 elementary schools, 185 gymnasia, and 42 realschulen. There are universities at Budapest, Klausenburg, and Agram of which the first-named, the largest of three, had 222 members in its faculties, and 4,407 students. In 1896 out of 5,256,241 children, 2,534,629 were at school. Newspapers and periodicals to the number of 1,080 were published in 1896 and of these 883 were in the Magyar language. Few countries in the world show such racial diversity as Hungary. The principal ethnic elements are Magyar, Servian and Croatian (especially in Transylvania), German, Bohemian, Moravian and Slovak, Ruthenian, Slavenian and Gypsies, of which the Magyar is the most numerous, numbering 7,426,730 in 1890.

Religion.—In spite of the great variety of religious sects in Hungary, including Roman Catholic, Calvinists, Lutherans, Orthodox Greeks, Armenians, Unitarians, Israelites, and Nazarenes, great tolerance is shown and different denominations live side by side without display of bigotry. The liberalism of the upper clergy in Hungary is especially marked. The bishops are men of intelligence and breadth of view, who show a good deal of independence in their own lives and modes of thought and do not criticise the independence of others. The Roman Catholic clergy of Hungary resemble their co-religionists in the United States in their enlightenment and in the spirit of toleration which they display. The membership of the United Greek Church is estimated at 800,000, of whom 200,000 are Magyars. The liturgy is in old Roumanian for the Roumanian-speaking members and in old Servian for the Servian members. The Magyars recently asked permission to employ a liturgy written in their own language. The Hungarian bishops did everything they could to meet this request, permitting important parts of the liturgy to be translated into Hungarian. This toleration, however, has not been expressly authorized by the Roman Curia, which has declared that the Hungarian tongue should not be employed in the liturgy.

Government.—The present status of Hungary as a portion of the dual monarchy, dates from June 8, 1867, when Franz Joseph, Emperor of Austria, took his oath to the constitution and was crowned King of Hungary. The common affairs of the two parts of the monarchy, include foreign relations, military and naval matters, finance, commerce, indirect taxation, the coinage, railways, and defence. Legislation in regard to these matters is in the hands of the Delegations which are two in number and consist each of sixty members representing the legislatures of Austria and Hungary. Of these sixty members, twenty are chosen from the upper house and 40 from the lower house. The members of the Delegations are chosen for one year and are summoned each year by the Emperor at Vienna and Budapest alternately. Under the control of the Delegations are the executive departments of Foreign Affairs, War, and Finance. Politically Hungary includes the kingdoms of Hungary, Croatia-Slavonia, and Transylvania. It has its own Reichstag which comprises an upper house, known as the House of Magnates and a lower house, known as the House of Representatives. The former is made up of life peers, appointed by the crown, ex-officio members who are state officers, archbishops and other dignitaries of the Roman Catholic and orthodox Greek Church, representatives of the Protestant confessions, the archdukes, and three members from Croatia-Slavonia. The House of Representatives is composed of members chosen by all male citizens 20 years of age and over, subject to a low property qualification from which certain classes, including profes-

sional and scientific men, are exempt. In 1898 the House of Magnates had 181 hereditary peers, 84 life peers, 52 ecclesiastical dignitaries, 17 state dignitaries and judges, the archdukes who had attained their majority, and three delegates from Croatia-Slavonia; the House of Representatives had 453, of whom 413 were from Hungary and 40 from Croatia-Slavonia. The Hungarian Reichstag has jurisdiction over Hungary and over Croatia-Slavonia in such matters as are the common concern of those provinces and Hungary. It is summoned each year by the Emperor at Budapest. Croatia-Slavonia has its own provincial diet which meets each year at Agram, and consists of 90 members, but Transylvania is legislatively in union with Hungary. The agreement known as the *Ausgleich* binds the two countries in respect to financial and commercial affairs and in respect to the quota to be paid for the common financial needs of the Empire. This treaty was entered into for ten years and expired in December 1896. The Hungarian government, dissatisfied with the proportion of its contributions to the common expenses, hoped to secure more favorable terms, but no understanding being reached after long negotiations, the treaty was provisionally extended for one year on October 21, 1897.

Political Parties.—The political parties of Hungary comprise Liberals, Independents, and Nationalists, the last-named sometimes voting with the Liberals and sometimes with the Independents, according as the programmes of those parties bear upon national aims. The Liberals are the strongest numerically and in the election of October 1896, they made decided gains. As a result of that election they numbered 282, while the Nationalists numbered only 37. Within the last few years a new party, known as the Hungarian People's party, has come into existence with a programme distinctly hostile to the Liberals, and having for one of its objects the arraying of Catholic opposition to the measures of the government. It is thoroughly Anti-Semitic in spirit. In 1895 the Independent party was divided on account of a dissension in regard to its leadership, the majority adhering to M. Kossuth and the others following M. Ugron. In the lower house after the election of October 1896, there were 48 Kossuthists, 7 Ugronists and 20 of the People's party. The followers of M. Kossuth have urged complete separation of Hungary from Austria in everything except the person of the ruler. The premier in 1898 was Baron Banffy who had succeeded Dr. Wekerle in 1895. The strength of the Liberal element enabled Baron Banffy to carry out his programme of reforms in spite of the active opposition offered by the other parties.

Political Situation in 1898; Ruthenian Question.—Among the difficult political and social questions which engaged public attention in 1898 may be mentioned the issues arising from racial antagonism, Agrarianism, and the dispute over the renewal of the *Ausgleich*.

One of the serious problems that confronts the Hungarian statesmen at the present time is the Ruthenian question. The Ruthenians, a people of Slavonic race, have recently fallen into extreme poverty which appears to be on the increase. A parliamentary commission was appointed to ascertain the causes of this and a member of this commission declared it to be his opinion that the Ruthenians had suffered especially from the immigration of Jews from Russia and Galicia into Upper Hungary. The Jews, themselves, have seemed to be of this opinion; and some prominent members of that race have shown how the simple-minded Ruthenian peasants were made the victims of Jewish extortions and sharp practice. Whatever be the cause, it is certain that thousands of Ruthenians have been reduced to abject poverty, and being unable to earn a living have emigrated to the United States and to South America. Those who have remained at home were in 1898 threatened in some instances with actual starvation.

Agrarianism.—Agrarian socialism, discussed more fully in the articles AGRARIAN MOVEMENT (q. v.), appeared in 1898 to be on the increase in the countries of Gólmor, Semplin, Heves, Szabolcs, Csanád, and Bekes where a large number of the peasants broke out into actual revolt against the local authorities and took part in riots which resulted in several fatalities. These disturbances which began in the spring of 1898 and were repeated on a more formidable scale toward the end of the year, were due chiefly to the unjust division of land. In parts of Hungary the concentration of land in vast estates has proved a great injury, especially in the Alföld province. Recent statistics show that about 40 per cent. of the whole kingdom of Hungary is in the hands of less than 5,000 land owners, estates in this class having an area of one thousand acres and upwards. Some of the largest tracts of land are owned by the Esterházy family (480,000 acres), the Count of Schoenborn (26,000 acres), the Duke of Coburg (246,000 acres), etc. The existence of these enormous "latifundia" is one of the chief grievances of the peasantry.

The Ausgleich.—In December 1897, Premier Banffy brought in a bill for the provisional prolongation of the *Ausgleich* for one year. If the matter were not settled by May 1, 1898, it was provided that Hungary should decide for itself upon its com-

mercial relations with the rest of the Empire. The party headed by M. Kossuth withdrew their opposition and on Jan. 4 the bill became a law. But it was soon apparent that Austria and Hungary could not agree upon the terms of a permanent arrangement. Accordingly the government prepared a plan for a customs tariff for Hungary alone. Invitations were issued to the chambers of commerce and to industrial and agricultural associations throughout the country to send delegates to a conference which should discuss the proposed tariff. This proposal of an independent customs tariff naturally aroused opposition in Austria where it was regarded as revolutionizing the commercial and economic relations of the two countries. It was thought that its adoption would result in a tariff war to the great detriment of all parts of the Empire. In Hungary its supporters thought the attempts to renew the *Ausgleich* would fail, and they wished to be prepared for that emergency. But this policy was not viewed with favor by the Hungarian government. Premier Banffy declared that the ministry and the entire Liberal party were opposed to severing the economic relations between Hungary and Austria. The Kossuthists, however, said they would oppose any measure which did not give Hungary the right of settling this economic question independently.

The dispute was still going on at the close of the year 1898. In order to enable the government to put through its measure in spite of parliamentary opposition, the Liberal leader, Count von Tisza, invited members of the Chamber to sign a certain memorial. This aroused a storm in the Chamber on the ground that it was an attempt at coercing the party leaders. M. Horanski, the President of the Liberal Club, where the memorial was awaiting signature, used language insulting to Baron Banffy who was in sympathy with the scheme, and the result was a duel December 1898, which, however, did not end fatally to either combatant. For further details as to the dispute over the *Ausgleich* and other matters of common interest to both parts of the monarchy, see the article AUSTRIA-HUNGARY.

HUNTER, WILLIAM ALEXANDER, LL. D., sometime professor of Roman law in University College, London, died July 21, 1898. He was born in 1844; educated at the University of Aberdeen, became a barrister in the Middle Temple, 1867, and was Liberal Member of Parliament for North Aberdeen, 1885-96. He wrote *Roman Law in the Order of a Code*.

HYDROGEN. Dewar has succeeded in liquefying hydrogen and believes he has also determined the boiling point and the specific gravity of this metalloid; for in its liquid state hydrogen does not possess metal characters. The density of liquid hydrogen was found to be .07, or $\frac{1}{14}$ that of water, it is therefore a very deceptive fluid as far as appearances go. Heretofore liquid marsh gas was the lightest known liquid, its density at the boiling point being .417 but liquid hydrogen has only $\frac{1}{6}$ th the density of this substance. Hydrogen in its liquid state is 100 times denser than its vapor given off at its boiling point, whereas liquid oxygen is 255 times denser than its vapor. The boiling point of hydrogen has been determined to be—238° C. or 35° absolute.

HYDROGEN, LIQUEFACTION OF. See PHYSICS (paragraph The Liquefaction of Hydrogen).

HYGIENE, SCHOOL. Recent examination of over 1,000 school children in Buffalo, N. Y., has resulted in the discovery that imperfect vision is extremely frequent, and owes its existence in very many cases to defective school-furniture and bad light. The percentage of near-sighted pupils in the primary classes is extremely small, but in the higher grades it increases rapidly until in the High School graduates it reaches 19.7. This means that one in every five children becomes near-sighted before completing the course. The causes are stated to be ill-adjusted desks or seats; imperfect light, necessitating too near an approximation of the eyes to the page; or the admission of light at a wrong angle resulting in a glare in the eyes or blurring what is being written by the pupil. Adjustable desks have been ordered. It was found that the roller-towel had been retained in a few schools, and that contagious eye-diseases have been propagated through its use.

HYPNOTISM, formerly called animal magnetism and mesmerism, is the term used to cover the whole body of phenomena connected with hypnosis, a state of the body and mind much resembling sleep but which has certain striking peculiarities. 1. It is generally induced by one person upon another but *may* be self-induced (auto-hypnosis). 2. It resembles sleep in that the subject of hypnosis is oblivious to all about him except the person who is hypnotizing him, with whom he exhibits what has been termed *rapport*. This implies that when one person hypnotizes another the latter pays attention to the former and acts in accordance with his expressed desires which are under any form whatever known as suggestions. 3. The hypnosis seems to discover in the subject a secondary or sub-conscious personality which is in an extraordinary way suggestible. The subject may be told to do and carries out anything within the bounds of physical possibility, but it will be seen (in the sub-head

Hypnotism in the Cure of Disease) that these bounds have to be considerably enlarged in order to contain some of the well known facts of psycho-therapeutics.

The relation of hypnosis to normal sleep is disputed, some authorities maintaining that it is a form of deep sleep while others looking to the fact that the organism is in hypnosis capable of many forms of activity, say that it is an awakening rather than a going to sleep of the mental faculty. Of the many forms of activity just mentioned perhaps the most extraordinary is the hyperæsthesia or abnormal acuteness of the senses which is occasionally though not always developed.

Crystal-Gazing.—One of the many instances of the increased vividness of sensation and of imagination which is a characteristic of the hypnotic state was investigated in 1898 by Dr. Morton Prince of the Harvard Medical School and of the Boston city hospital. A young woman patient of his, was found by him to possess the faculty of seeing vivid visual hallucinations when her eye was fixed upon a bright object such as the bulb of an incandescent electric light. These hallucinations when investigated were found to be of three kinds: 1. Those which were the life-like reproductions of past scenes which the patient had seen but had completely forgotten. 2. Those containing incidents which, though true, she could not have seen or have been in any way conscious of by the ordinary forms of sensation. 3. Those which were evidently the creations of a vivid imagination but whose incidents could not be proved not to have occurred at some time. These hallucinations induced by looking fixedly at the bright object were all as vivid as real sensations and were beheld by the patient with no little emotion. They were described as occurring before her eyes and blotting out the room in which she was. These experiments are noticed here, because after each vision had ceased either by the patient's turning her head away or being interrupted by Dr. Prince, she was hypnotized and while under this influence gave a full account of the incidents of which she had during the crystal vision only the visual aspect. Furthermore she passed from this hypnotic condition into still another so that the case became one of multiple personality. In this as in other cases already reported the first hypnotic personality, called XI was of a different temperament from the original, X, and knew, besides her own memories all those of X while X knew nothing of what happened to her when she was XI, and the second hypnotic personality was of still greater scope and gayer mood. The significance of these experiments will be seen when it is understood that the two hypnotic personalities with their wider and still wider memories, show how very little of what a person sees, hears, and feels is really forgotten beyond the possibility of recall. It is as if the sub-conscious personality continually recorded a much wider range of impressions than can possibly be *taken in* by the span of ordinary working consciousness. Dr. Prince, it may be added, observed that in a fever which caused delirium in the case of the above-mentioned patient, the first hypnotic personality XI was shown to have been unaffected by the disease, and not to have been delirious; Miss X after recovering from the fever was hypnotized, and in her hypnotized condition, as XI, gave an account of all that had happened during the delirium—facts of which Miss X was entirely unaware.

Theories as to the Nature of Hypnosis.—I. As to its normality or abnormality. As was for a long time the case with chemistry and astronomy, hypnotism suffers from the evil associations given to it by its original users. The fact that the first great modern hypnotizer practised almost entirely upon persons who were suffering from the malady known as hysteria long caused hypnosis (or the state of being hypnotized) to be considered as an indication of the hysterical nature of the person hypnotized. The functions of the brain have been theoretically divided into three kinds, those governing (1) the purely negative processes of the body such as digestion, (2) those reflex actions and automatic actions which every one does, generally, unconsciously or only half consciously, and (3) the *thought* which requires the fullest attention of consciousness. Different seats in the brain have been suggested for these three kinds of function. Dr. Morton Prince of Harvard University published in 1898 the results of some experiments made by him on hysterical patients which go to show that hysteria may be considered as the dissociation of the functions of the two first named kinds as illustrated in the following case: A woman came to him with (as one of the several symptoms of hysteria) all sensibility gone from her left hand. She could feel neither pricking nor pinching, and if she could not see her hand would not know where it was or what was happening to it. A screen was placed between her hand and face and the hand was pricked and then pinched with a small pair of nippers. She did not feel any of these things. She was then hypnotized and while in that state was again asked what had been done to her hand. This time she told exactly what had been done, even that the hand had been pricked first 13 and then 5 times and pinched 5 times. While hypnotized she could also feel perfectly with the previously insensible hand. These experiments show that the feeling was in the hand even though the patient was not conscious of it at the time; and that, therefore the insensibility of the hysterical condition comes not from a failure of the

brain to act but from a failure to act all at once, and that the consciousness in hysteria is limited to one kind of brain function described above. In normal life the three kinds work together and the consciousness of the highest kind can take cognizance, though it does not always do so, of the activity of the other kind. Hypnotism, on the other hand, operates with the effect of transferring consciousness from one kind of function to another and in the case of the woman referred to above brought the sensations from the lower to the higher region of the brain. In other words, hysteria is the partial failure of one kind of action of the brain, while hypnotism results in completely putting to sleep one kind of brain activity meanwhile admitting other kinds of brain activity to consciousness. It is now pretty well agreed by the best authorities on hypnotism, 1, that it is not a *psychosis* or abnormal (in the sense of morbid) mental development, 2, that it is not an emanation of force or will power from one person to another. This is the doctrine of the many professional "platform" hypnotists who pretend to teach the art of exercising one's will over others. The possibility has not yet been completely denied though in a discussion at the meeting of the British Medical Association at Edinburgh in July 1898, it was considered highly improbable, 3, that it is no more than suggestion. Suggestion apart from its ordinary meaning has, in psychology, acquired a special meaning best conveyed in the words: "the presentation of an idea to the mind in such a way that it shall occupy the entire field of consciousness. It will then be seen that hypnotism is the state in which suggestion can best be made and that from this point of view suggestion and hypnotism are two sides of the same shield; but much that is done by a person in the state of hypnosis as will presently be seen, can be done by the aid of suggestion alone, verbal or otherwise, without the aid of the hypnotic sleep.

Hypnotism in the Cure of Disease, otherwise known as psychotherapeutics or suggestive therapeutics. It has been repeatedly urged that suggestion, the common basis of faith cure, mind cure and Christian Science is the cause of the greater portion of the success which has attended the use of drugs in the art of medicine. Most important of all the claims advanced within the last few years as to the powers of hypnotic suggestion in the cure of disease has been the statement that by its means the negative processes of the body are brought within the influence of volition. For instance, some have said that the character of the blood can be changed, tissues built up or destroyed, inflammation caused or prevented merely by hypnotic, or other, suggestion and absolutely without any drug whatsoever. In July, 1898, at the meeting of the British Medical Association, a number of well known physicians reported certain cures that had been effected by hypnotism alone after other means had been tried and had failed. Dr. J. Milne Bramwell reported eight cases of eczema, hyperhidrosis, neurasthenia, dipsomania, and neuralgia which had been successfully treated by him with the hypnotic treatment, sufficient time in all the cases having elapsed between the treatment and the report to enable the permanence of the therapeutic results to be fairly estimated. Dr. John F. Woods reported that he had treated over 1,000 cases of disease by suggestion, and pointed out that some of his best results were in the so-called organic diseases where some destruction or morbid change of tissue had already taken place, and mentioning as instances, organic heart disease, rheumatic fever, pleurisy, pneumonia, typhoid fever and tabes dorsalis. Such claims, however, are regarded as extreme.

The extent of the use of hypnotism in the cure of disease in the United States is practically impossible to estimate but it seems to be of some importance. A periodical called *Suggestive Therapeutics* is published in Chicago devoted to this branch of the medical art. In addition to the number of professional hypnotists who pretend to teach the art of mesmerism, fascination and incidentally the cure of diseases for a small sum of money and who are little better than charlatans, there are sanatoriums and schools of suggestive therapeutics in several places in the United States; in New York, Illinois and Missouri. It has been said, however, that in the United States the force of conservatism brought to bear upon physicians has prevented the open acknowledgment of their use of the hypnotic treatment, though it has not prevented the use of hypnotism in certain cases. In Great Britain, on the other hand, the treatment has been studied and practised for many years by some of the most eminent physicians, and in France where there are two schools of hypnotism, and in Germany and Sweden valuable contributions to the knowledge of the nature of hypnosis have been made.

The trend of opinion in the United States during the past year has been in the direction of restricting the practice of hypnotism to physicians; and among physicians of experience in the matter the conviction is growing rapidly that hypnotism as a therapeutic measure is of use in a small proportion of cases, and is a justifiable resort in still fewer cases. The situation is admirably summed up in the following digest, published in the *Philadelphia Medical Journal* of the article on *The Medico-Legal As-*

pects of Hypnotism by Sidney Kuh, in the *American Journal of the Medical Science* for Dec. 1898:

"It is generally considered that hypnotism is a pathologic and not a physiologic condition. When resorted to too frequently it is liable to bring on mental deterioration. It may lead to chronic headache and hysteria; it may induce an outbreak of insanity; in a few cases it has been directly or indirectly responsible for the death of the patient. The question whether the physician is justified in using a remedy that presents so many dangers to life in cases of diseases that are so little dangerous, as are hysteria and neurasthenia, Kuh answers emphatically in the negative. His experience has been that suggestion in the waking state is almost equally efficient. Hypnotism should be used as a therapeutic agent only when other methods have failed. The question, Can the hypnotized fall victim to crime? has been answered affirmatively by those whose experiments were made in the laboratory. From practical life, however, Kuh could find only one case in substantiation. The reasons why hypnotism is so rarely used for criminal purposes are that: (1) Not every person can be hypnotized even when willing; (2) Not all suggestions are acceptable to the hypnotized, and those that are particularly distasteful to him or foreign to his habits and character are often rejected. Thus, Richet has published the following example: One of his subjects who allowed himself to be metamorphosed without difficulty into a sailor, an officer, etc., refused on the contrary, with tears in his eyes, to be changed into a priest, a refusal that the character and habits of the subject and the environment in which he had lived sufficiently explained. (3) There is, in the majority of cases, no blind absolute obedience. The hypnotized may awake at any moment during the proceedings, and this is particularly liable to occur when his suspicions are aroused by anything that is going on around him, or if an inconvenient suggestion be given just before the time at which the suggestion is to be executed. (4) Complete loss of memory for what has been going on during hypnosis is not by any means a rule, lacking exceptions. (5) Finally, if all those difficulties have been overcome, the way in which the criminal act would be executed would immediately suggest the existence of hypnotic influence. It would be an automaton that commits the crime, unconscious of antecedent and surrounding circumstances and uninfluenced by the presence of witnesses, or by any unforeseen event. The tool being supposedly devoid of all reasoning power in this state, it would be necessary to give such suggestions as would cover all possible contingencies that might arise during the commission of the crime; otherwise the deed would necessarily be done in a clumsy and impulsive manner. These are the principal reasons why hypnotism is so rarely used by the criminal classes. As to the responsibility of the hypnotized, if the possibility that the person was caused to commit the crime by hypnotism is acknowledged, then such a person must be considered irresponsible for his action, for hypnotism is a pathologic state in which the will-power of the subject is affected to a greater or less extent." For the latest literature on this subject, see Bernheim, *Suggestive Therapeutics*; Mason, *Telepathy and the Subliminal Self*; Tuckey, *Psycho-Therapeutics*; Kraft Ebing, *Experimental Study in the Domain of Hypnotism*; and Wetterstrand, *Hypnotism and its Application to Practical Medicine*.

ICE. Recent investigations tend to show that freezing has more effect upon typhoid fever germs than has been supposed. It has, however, been known for some time that in the formation of natural ice there is a strong tendency for the impurities in the water to be forced downwards, so that except in shallow places ice from ponds and streams should be purer than the water from which it is formed. Few typhoid epidemics have been traced to ice supplies. Nevertheless, ice supplies should be chosen from the purest possible sources, and it is highly advisable to place ice about water or food which is to be cooled, rather than in actual contact with it. Artificial ice, made from distilled or filtered water, with proper care in its manufacture and subsequent handling, is in some respects an ideal product.

ICELAND, a large island in the north Atlantic belonging to Denmark, with an area of 39,756 square miles, and a population of 70,927 in 1890. Its capital is Reykjavik. Its chief articles of export are Iceland moss, wool, dried fish, seal skins, oil, sulphur, eiderdown, bird skins, and ponies. The mineral wealth of Iceland is said to be considerable, but has not been developed. The manufactures have not passed the domestic stage. The export trade was valued in 1896 at 3,291,000 kroner, but the trade statistics for Iceland are defective. Emigration, which has increased in recent years, has been directed chiefly to Manitoba.

IDAHO, a western State of the United States, with a land area of 84,200 sq. m. Capital, Boise City.

Mineralogy.—According to the report of the Director of the Mint the production of the precious metals during the calendar year 1896 was gold, 104,263 fine ounces,

value \$2,155,300; silver, 5,149,900 fine ounces, coining value \$6,658,457—total \$8,813,757; increase in total value in a year, \$3,012,377. The annual report of Wells, Fargo & Co. for the calendar year 1897 showed for Idaho, gold production \$2,725,000; silver \$4,555,600; ores and base bullion \$2,741,000—total \$10,021,600; increase in a year \$1,207,843. In 1897, 647 short tons of coal were mined, the first reported since 1888. The State has been dependent on Colorado and Wyoming for its supply of coal; but in 1897 the discovery was made of an extensive deposit of bituminous coal of excellent quality near Soda Springs.

Agriculture.—In 1897 it was officially reported that there were 315,000 acres of land under cultivation by means of irrigation, and that 1,250,000 acres could be irrigated to advantage. The fruit acreage, 20,000, had doubled since 1890. The following shows the production and value of the principal crops in the calendar year 1898: wheat, 4,196,904 bushels, value, \$2,140,421; oats, 1,282,320, \$461,635; potatoes, 513,240, \$277,150; and hay, 756,862, \$3,708,624—total value, \$6,587,830. Live-stock comprised, horses, 128,077; mules, 917; milch cows, 31,500; other cattle, 384,055; sheep, 2,311,880; and swine, 75,718—total head, 2,932,147.

Banks.—On October 31, 1898, there were 10 national banks in operation and 4 in liquidation. The active capital aggregated \$600,000; deposits \$2,736,154. Six State banks had capital \$144,400; deposits \$397,428; resources \$637,282.

Education.—At the close of the school-year 1896-7, there were 31,883 pupils enrolled in the public schools and 22,645 in daily attendance. The value of all public school property was \$698,606; total expenditures, \$328,249, including \$197,283 for teachers' salaries. There were 7 public high schools; 7 private secondary schools; 2 public normal schools; and the State University at Moscow, which had 23 professors and instructors and 253 students. The university, endowed by Congress, received from the Federal government \$22,000 in 1897, and \$23,000 in 1898. In the last year there were 74 periodicals, of which 5 were dailies and 60 weeklies. The Federal government now maintains a contract and three boarding schools for Indian youth in the State.

Finances.—In 1897 the aggregate of assessed valuations was \$29,951,920; aggregate of taxes assessed on the counties, \$253,000. The total bonded debt in 1898 was \$393,000, of which the largest part was incurred for the construction of wagon roads and for the asylum improvement and State normal school. The State tax rate for 1897 was \$8.41 per \$1,000.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 165,000.

Woman Suffrage.—The city elections throughout the State show that the prejudice against equal suffrage is dead. Every city polled a large female vote, the best women going to the polls. In Kendrick, Miss Jessie Parker, twenty-two years of age, was elected mayor. This is the first woman-mayor in the State. For the first time in the history of Idaho women voted for a Congressman and State officers.

National Representatives and State Officers.—The delegate to the House of Representatives is: James Gunn (Pop.), from Boise City, and the Senators are: George L. Shoup (Rep.), from Salmon City and Henry Hirtfeld (Pop.), from Lewiston. The officials are: Frank Steunenberg, Governor; T. H. Hutchinson, Lieutenant-Governor; M. Patrie, Secretary of State; L. C. Rice, Treasurer; B. Sinclair, Auditor; S. H. Hays, Attorney-General; P. French, Superintendent of Public Instruction; D. W. Figgins, Adjutant-General; and F. J. Mills, State Engineer. All are Fusionists. Chief Justice, J. W. Huston (Rep.); Associates, I. N. Sullivan (Fus.), and Ralph P. Quarles (Fus.), and Clerk, Solomon Hasbrouck (Rep.). The State legislature consists of 37 Democrats and Populists, 21 Republicans, and 12 Silver Republicans.

ILLINOIS, a central State of the United States, with an area of 56,650 sq. m. Capital, Springfield.

Agriculture.—During the calendar year 1898 the state gained second rank in the production of both corn and oats and sixth in that of hay. The principal crops and their values were, corn, 199,959,810 bushels, value, \$49,989,952; wheat, 19,334,348, \$11,600,609; oats, 88,303,579, \$20,309,823; barley, 351,242, \$136,984; rye, 1,957,593, \$465,341; buckwheat, 70,182, \$36,495; potatoes, 11,525,360, \$5,301,666; and hay, 3,178,732 tons, \$18,754,519—total value, \$106,595,389. The farm animals in 1898 comprised 1,003,299 horses; 82,225 mules; 1,001,212 milch cows; 1,265,066 oxen and other cattle; 613,191 sheep; and 2,008,265 swine—total head, 5,973,258.

Industries.—Illinois ranks second in the production of bituminous coal. In the calendar year 1897 the output was 20,072,758 short tons, valued at \$14,472,529, an increase in a year of 286,132 tons and a decrease in value of \$1,337,207. The State Bureau of Labor Statistics reports that the tonnage of 1896 was only equalled once, in 1893, in the history of coal-mining in the State. Coal was taken from 901 mines and openings in 51 counties, and 256,969 tons were mined to every life lost and 29,444 tons to every man injured. (See COAL.) The various clay products had a value in 1897 of \$5,398,574, principally brick and tile, and the stone products, \$1,497,407,

principally limestone. There are only two deposits of fluorspar known to exist in the United States, and prior to 1896 the entire domestic supply came from Rosiclare, Ill. In that year 1,500 tons were mined at Marion, Ky., and 5,000 tons at Rosiclare, the total value being \$52,000. In 1897 the production in Illinois was 2,500 tons; in Kentucky, 2,562. During 1898 there was a greater and wider activity in all lines of manufacturing than in the past year, a most noteworthy increase being in the allied iron and steel industry.

Commerce.—During the fiscal year ending June 30, 1898, the imports of merchandise at the port of Chicago were valued at \$10,141,413, a decrease in a year of \$1,386,139; and the exports, 7,488,886, an increase of \$5,179,337. There was also an importation of silver amounting to \$15,537, making the total trade of the year \$17,645,836, an increase in a year of \$3,808,735. During the month of June 1898, the tonnage of the vessels engaged in the foreign trade of the port was: Entered, American 20,725; foreign, 11,001,—total, 31,726; cleared American, 46,481; foreign, 12,055,—total, 58,536; grand total, 90,262. Of the total American tonnage 62,502 was steam and of the total foreign 15,146.

Railroads.—Illinois is the banner railroad State in the country, having more trackage than Pennsylvania or Texas, which now rank second and third. There is a wide diversity in reports of the mileage owing to the different methods of computation. In 1897 the State Auditor reported 110 distinct railroads, with a total main trackage of 10,989 miles. Second main and side tracks exceed 5,000 miles in length; but it is impossible to approximate even the length of the countless branches, spurs, sidings, etc., that have been laid out for the accommodation of the great industrial plants. The main system, the Illinois Central, reported in 1897; gross receipts from traffic in the year, \$22,110,937; operating expenses and taxes, \$15,735,884; net receipts from all sources, \$8,539,248; dividends paid, \$2,625,000; reserved for future dividends, \$924,461.

Banks.—On October 31, 1898, there were 219 national banks in operation and 91 in liquidation. The active capital aggregated \$37,046,000; circulation, \$9,093,199; deposits, \$184,566,659; and reserve, \$58,617,133. The State banks, loan and trust companies, and savings banks numbered 139, and had aggregate capital, \$17,148,000; deposits, \$118,602,962; resources, \$159,956,854; and surplus, \$7,270,699. There were also 119 private banks with total capital, \$2,781,384; deposits, \$10,444,624; resources, \$14,620,177; and surplus, \$615,110. During the year ending September 30, 1898, the exchanges at the United States clearing houses at Chicago, Peoria, and Rockford aggregated \$5,448,832,573, an increase in a year of \$1,041,462,504.

Education.—At the close of the school year 1896-7, there were 920,425 pupils enrolled in the public schools and 705,481 in attendance. The teachers numbered 25,541. Public school property was valued at \$45,143,755, and the expenditures were \$16,335,550, of which \$10,377,443 was for teachers' salaries. There were 327 public high schools, with 1,219 teachers and 31,909 pupils; 61 private secondary schools, with 303 teachers and 3,297 pupils; 3 public normal schools, with 45 teachers and 1,855 students; and 10 private normal schools, with 59 teachers and 1,642 students. The colleges and universities, co-educational and for men only, numbered 31, and had 771 professors and instructors, 9,457 students, and \$2,407,388 income; and the colleges for women numbered 4, and had 60 professors and instructors, 429 students, and \$102,644 income. There were also 14 theological, 7 law, and 14 medical schools, with a total of 787 instructors and 5,187 students. The agricultural and mechanical department of the University of Illinois, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year the periodicals numbered 1,619, of which 169 were dailies, 1,099 weeklies, and 254 monthlies.

Finances.—The total assessed valuation in 1897 was \$799,695,853, a decrease of nearly \$17,000,000 from that of 1896. In 1873 it was \$1,355,401,317. For several years the State has had no bonded debt excepting bonds for \$18,500, which have never been presented for payment and are probably destroyed.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 4,625,000. Local estimates gave Chicago 1,800,000; Peoria 69,000; Quincy, 40,000; Rockford 35,000; and Springfield, 35,000.

Legislation in 1897 and 1898.—The legislature in 1897 increased the salaries of justices of the Supreme Court from \$5,000 to \$7,000 per annum; created a State Board of Pardons; and passed bills prohibiting the employment of children under fourteen years of age in factories, etc., requiring the teaching in public schools of the effects of alcoholic stimulants upon the human system, and prohibiting the fusion of political candidates. At the winter extra session of the legislature the revenue and appropriation bills were passed besides a bill affecting primary elections. According to this any voter registered for the general election may cast his vote in the primary upon taking oath that he belongs to the party, but, if challenged, must be able to secure the affidavit of two householders, to his party membership. The primary election officers are chosen by the party committee from the regular election officers

belonging to the party, but the general bi-partisan election board controls the primaries of all parties. In order to detect fraud and prevent the stuffing of the ballot box, it is required that the ballots must be uniform and that the name of each elector voting at the primary must be entered with a number opposite it, the same number to be placed on the back of his ballot for the general election. The legislature has also thoroughly revised its very unsatisfactory system of assessing the general property tax.

Events of 1898.—The year 1898 was marked by a heavy vote, nearly equaling the vote of 1896. The Democratic State Convention witnessed a bitter fight over the appointment of the State Central Committee of two men prominent as Gold Democrats in 1896. These were Ben T. Cable of Rock Island and Roger C. Sullivan of the Fifth Congressional district. Ex-Gov. Altgeld made a speech claiming credit for the Democrats for the war with Spain. The Republicans were victorious with an overwhelming majority of votes. Frank S. Rogan, Prohibitionist, was elected to the legislature from Winnebago county, the first time in the history of Illinois that a Prohibitionist candidate has won. The Illinois Supreme Court decided that the Chicago Electric Railway Company should pay the fee to the city, demanded by the city. A levee at Shawneetown on the Ohio broke, and occasioned the loss of many lives.

On Oct. 12 at Virden the importation of negro miners to take the place of strikers caused a riot in which 12 were killed and 25 were wounded. See **STRIKES AND LOCKOUTS**.

The U. S. Supreme Court (April 18) upheld the constitutionality of the Civil Service Law of the State of Illinois. The Superintendent of Police had refused to supply a list of vacancies, etc., as required by the law, taking the case into court upon the plea that the law was contrary to the Federal Constitution. The State Court was upheld.

Officers.—The 22 delegates to the House of Representatives are: James R. Mann (Rep.), from Chicago, William Lorimer (Rep.), from Chicago, George P. Foster (Dem.), from Chicago, Thomas Cusack (Dem.), from Chicago, E. T. Noonan (Dem.), from Chicago, Henry S. Boutell (Rep.), from Chicago, George E. Foss (Rep.), from Chicago, Albert J. Hopkins (Rep.), from Aurora, Robert R. Hitt (Rep.), from Mount Morris, George W. Prince (Rep.), from Galesburg, Walter Reeves (Rep.), from Streator, Joseph C. Cannon (Rep.), from Danville, Vespasian Warner (Rep.), from Clinton, Joseph V. Graff (Rep.), from Pekin, Benjamin F. Marsh (Rep.), from Warsaw, W. E. Williams (Dem.), from Pittsfield, Ben. F. Calwell (Dem.), from Chatham, Thomas M. Jett (Dem.), from Hillsboro, Joseph R. Crowley (Dem.), from Robinson, J. R. Williams (Dem.), from Carmi, W. A. Rodenberg (Rep.), from East St. Louis, and George W. Smith (Rep.), from Murraysboro. The Senators are Shelby M. Cullom (Rep.), from Springfield and William E. Mason (Rep.), from Chicago.

The officials are: John R. Tanner, Governor; W. A. Northcott, Lieutenant-Governor; James A. Rose, Secretary; F. K. Whitmore, Treasurer; J. S. McCullough, Auditor; E. C. Aiken, Attorney-General; J. N. Reece, Adjutant-General; J. R. B. Van Cleave, Superintendent of Insurance; and Alfred Bayliss, Superintendent of Education. All of these are Republicans. Chief Justice, Joseph N. Carter; Associates, J. W. Wilkin (Rep.), J. H. Cartwright (Rep.), A. M. Craig (Dem.), Jesse J. Phillips (Dem.), B. D. Magruder (Rep.), and C. C. Boggs (Dem.); and Clerk, A. D. Cadwallader (Rep.). In the State legislature there are 87 Democrats, 115 Republicans, 1 Populist, and 1 Prohibitionist.

ILLINOIS, UNIVERSITY OF, between Champaign and Urbana, Illinois, was opened for instruction in 1868. It is non-sectarian, co-educational, and is largely supported by the State of Illinois. For the academic year 1898-99 there were 214 officers of instruction and 1,750 students; for the previous year the students numbered 1,585, in 1891, 519. Besides departments of literature and arts, there are departments of science, law, engineering, art, architecture, music, military science, agriculture; the university includes the State Library School, and the College of Physicians and Surgeons and the College of Pharmacy at Chicago. In 1898 there were 375 courses of instruction; the library comprised 50,000 volumes; there were 15 buildings. The law course is three years in length and the medical course four years. The president is Andrew S. Draper, LL. D. See **UNIVERSITIES AND COLLEGES**.

ILOILO. See **PHILIPPINE ISLANDS**.

IMMIGRATION. A bill for restricting immigration, passed during the final session of the Fifty-fourth Congress, was vetoed by President Cleveland. The House thereupon voted to pass the bill over the President's veto by 193 to 39. The Senate, however, adjourned without taking action. Mr. Lodge of Massachusetts, introduced a bill in the next Congress (1897) closely resembling the former one. It provided that to the classes of immigrants already declared to be inadmissible there be added persons over sixteen years old who were unable to read and write some language, excepting, however, immigrants' parents or grandparents over fifty years of age, and

wives and minor children. This bill, unlike its predecessor, did not forbid the employment on public works of "aliens who come regularly," that is, Canadians; Cubans also, pending the existing difficulties, were exempted. This bill was passed by the Senate in the first session of the Congress, but at the last session, in December, 1898, the House by a vote of 103 to 100, refused to consider the bill. This was a surprise since there was a Republican majority of 57 in the House and since the bill accurately expressed the sense of the immigration plank in the Republican platform, which is as follows:

"For the protection of the equality of our citizenship and of the wages of our workmen against the fatal competition of low-priced labor, we demand that the immigration laws be thoroughly enforced, and so extended as to exclude from entrance to the United States those who can not read and write."

Only 92 out of 207 Republicans supported the bill and only 8 Democrats out of 150, while 32 Republicans and 71 Democrats united to defeat it. The vote was not closely sectional, though the majority of its opponents came from the West and South, where immigrants still seem to be desirable. Of course, there was no debate on a motion for consideration, but, according to a leading journal, the reasons for the defeat of the bill were as follows: "(1) The desire for immigrants to develop our natural resources; (2) The generous belief that we have no right to exclude; (3) the desire for cheap labor; and (4) the opposition of the Catholic Church and of the brewing interests to a measure which would restrict the power of the one and the patronage of the other." The defeat of this measure seems to postpone indefinitely the addition of any restrictions to our immigration laws.

Recent official reports show a decrease in immigration. During the fiscal years ending on the 30th of June, 1896, 1897, and 1898, the total immigration to the United States was respectively 343,267, 230,832, and 229,299. The character of European immigration is changing; the proportion from southeastern Europe remains about stationary, but that from northwestern Europe is diminishing. In 1895 this latter amounted to 50 per cent.; it fell to 39 per cent. in the following year and to 38 per cent. in 1897. The year 1897, as compared with 1896, showed a slight decrease in general illiteracy and an increase in the average amount of money brought by each new comer. The percentage of those over fifteen years of age unable to read and write their own language, from the European nations sending more than 2,000 immigrants, for the fiscal year 1897, was as follows: Denmark, 0.5; Sweden, 0.9; Norway, 1.1; Germany, 1.8; England, 4.1; France, 4.3; Ireland, 6.4; Finland, 8.2; Russia, 27.9; Austria-Hungary, 28.1; Poland, 39.4; Italy, 50.9. Of the 229,299 immigrants in the fiscal year 1898, there were 135,775 males and 93,524 females; 38,267 under fifteen years of age; 164,905 between fifteen and forty, and 26,127 over forty. Illiterates over fourteen years old numbered 44,473; those bringing thirty dollars or more, 27,608, less than thirty dollars, 96,203. Of the total number 42,596 had previously been in the United States and 10,737 came through Canada. Of the 3,030 who were debarred 417 were contract laborers. The countries chiefly represented were as follows: Italy, 58,613; Austria-Hungary, 39,767; Russia proper, 27,221; Ireland, 25,128; Germany, 17,111; Sweden, 12,398; Turkey in Asia, including Syria, 4,275; Japan, 2,230; China, 2,071. The total immigration tax receipts were \$326,644, and the expenditures were \$244,380. Mr. Powderly, the Commissioner-General of Immigration, recommended some specific legislation to effect easier regulation of immigration from Canada; he suggested that certain points along the border be designated as the only places of entry.

IMMUNITY. See LEPROSY and SERUM THERAPY.

IMPERIAL ACADEMY OF SCIENCES OF SAINT PETERSBURG. founded by Peter the Great in 1724 in three classes: mathematics, natural history and history and jurisprudence. The first academicians were all foreigners. The first Russian member was the poet Lomonosor. From 1783 to 1794 the Princess Dachkov was the president, and she organized meetings in the Russian language and undertook the publication of periodicals in Russian. Under the presidency of the Count Ovarov the Academy progressed rapidly. To-day the Russian Academy is entirely national, and there are but few foreign members. Many important scientific expeditions have been sent out by this Academy.

IMPORTS AND EXPORTS. The imports for the 11 months of 1898, ending with November, were but \$579,844,153, while those of the corresponding months of 1897 were \$691,089,266, and those of the 11 months of 1896, \$622,598,896. The highest excess of exports in any preceding calendar year was \$357,090,914 in 1897, and \$324,263,685 in 1896. With the largest exports of merchandise in our history and smallest imports in many years comes the largest importation of gold in any calendar year. The gold imports for the 11 months ending with November, were \$149,396,370, while no full calendar year save 1896 ever reached the hundred million dollar line, and in that year the total for the 12 months was but \$104,731,259 against \$149,396,370 for the 11 months of 1898. The effect of this large importation of gold in conjunction with the increased production from our own mines, is plainly visible in

the increased circulation of that metal. The gold in circulation on December 1, 1897, was \$658,986,513 against \$544,494,748 on December 1, 1897; \$516,729,882, on December 1, 1896, and \$456,128,483 on July 1, 1896. The total circulation on December 1, 1898, was \$1,886,879,504, against \$1,721,084,538 on December 1, 1897, \$1,650,223,400, on December 1, 1896, and \$1,509,725,200 on July 1, 1896.

The exports from the United States during the calendar year 1898 exceeded those of any earlier year. Only twice in our history have the exports in a calendar year passed the billion-dollar mark; in 1898 they were \$1,255,494,358. During the 11 months of 1898 ending with November, they were greater than in any full full calendar year preceding, the total for the 11 months being \$1,117,681,199. The November exports were \$129,783,512. Certainly the record for the year has far surpassed that of any preceding calendar year. The figures of the Bureau of Statistics, United States Treasury Department, show that the November exports are not only the largest in November, but the largest in any month in the history of our commerce. Of breadstuffs, the exports for the 11 months ending with November, 1898, are the largest in our history, being \$277,135,341 against \$223,211,617 in the great exporting year of 1892. Provisions are for the 11 months \$148,417,850 against \$125,297,007 in the 11 months of 1892. Cotton for the 11 months amounts to \$192,323,391, a figure slightly below that of 1896, though the total number of pounds exported by far exceeds that of the corresponding months in any preceding year, being for the 11 months 3,436,032,504, or, measured in bales, 6,722,283—a larger total in bales or pounds than that of any full calendar year preceding.

The following table shows the imports and exports of merchandise and gold in each calendar year since 1884.

Calendar year.	Merchandise.		Gold.	
	Imports Dollars.	Exports Dollars.	Imports Dollars.	Exports Dollars.
1884	629,261,860	749,366,428	27,957,657	40,948,246
1885	587,868,673	688,249,412	23,645,311	11,417,207
1886	663,429,189	713,404,021	41,309,181	41,283,222
1887	708,818,478	715,301,044	44,889,299	9,144,426
1888	725,411,371	691,761,050	10,960,773	34,526,447
1889	770,521,965	827,106,347	12,004,632	50,933,460
1890	823,397,726	857,502,548	20,230,090	24,063,074
1891	828,320,943	970,509,646	44,970,110	79,086,581
1892	840,930,955	938,420,660	17,450,946	76,532,056
1893	776,248,924	876,108,781	72,762,389	79,775,820
1894	676,310,310	825,102,248	21,350,607	101,978,689
1895	801,673,307	824,860,136	34,396,392	104,967,402
1896	681,579,556	1,005,843,241	104,731,259	58,256,890
1897	742,623,893	1,099,714,807	34,020,592	34,276,401
1898	634,958,229	1,255,494,358	158,151,852	16,194,954

Imports and Exports From and to the Grand Divisions for 1897 and 1898. The imports and exports in per cent. from the several grand divisions of the world were as follows:

Division.	Imports.		Exports.	
	1897.	1898.	1897.	1898.
Europe	56.26	49.66	77.39	79.07
North America	13.85	14.83	11.89	11.35
South America	14.04	14.95	3.21	2.75
Asia	11.41	15.03	3.74	3.63
Oceanica	3.19	4.36	2.16	1.78
Africa	1.25	1.17	1.61	1.42

Exports of Iron and Steel.—The exports of these for 1898 are as follows: Iron ore, 11,537 lbs., valued at \$34,224; pig iron (1897) 168,890 lbs., valued at \$2,331,771; bar iron, 10,684,034 lbs., valued at \$163,261; bars or steel rods other than wire, 37,776,372 lbs., valued at \$470,052; railroad bars or rails, iron, 2,767 tons, valued at \$37,150; steel, 229,783 tons, valued at \$4,613,376; billets, ingots and blooms, 16,100 tons, valued at \$290,827; plates and sheets, iron, 9,087,071 lbs., valued at \$182,809; steel, 27,360,932 lbs., valued at \$354,579; structural iron and steel, 30,586 tons, valued at \$1,183,482; wire, 137,054,694 lbs., valued at \$2,593,306; car wheels, 21,006 wheels, valued at \$129,446.

Gunpowder and Other Explosives.—The exports for the year were as follows: Gunpowder, 1,202,971, valued at \$139,644; cartridges and other explosives to the value of \$1,255,762.

Agricultural Implements.—Mowers and reapers and parts of, valued at \$5,500,665; plows and cultivators and parts of, \$927,250; all other parts, \$1,181,817.

Brass and Manufactures to the value of \$1,320,093.

Bricks, building and fire, \$157,274.

Carriages, Cars and Parts of Cars.—For steam railways, \$1,478,188; for other railways, \$260,393; cycles and parts, \$6,846,529; and all other carriages and parts, \$1,685,838, making a total of \$10,270,948.

Copper sulphate, 14,736,373 lbs., valued at \$475,717.

Clocks, Watches and Parts, \$1,727,469.

Coal.—A total of 4,008,996 tons of hard and soft coal valued at \$11,683,749.

Copper Ore, 8,395 tons, valued at \$824,165; ingots, bars and old lbs., 278,956,641, valued at \$31,075,636. All other manufactures of, brought the total up to \$32,180,872.

Cottons and Manufactures of.—Unmanufactured, 3,850,264,295 lbs., exported, valued at \$230,442,215; manufactured cloth, colored, 79,415,376 yds., exported, valued at \$4,138,887; manufactured cloth, uncolored, 191,092,442 yds., exported, valued at \$9,151,936; manufactured cloth, total, 270,507,818 yds., exported, valued at \$13,290,823; total manufacturers cotton, \$17,024,092.

Machinery.—Electrical, \$2,052,564; metal workings, \$4,618,683; pumps and pumping machinery, \$2,023,034; locomotives, 468 engines, valued at \$3,883,719; total products manufactured from iron and steel excepting ore, \$70,406,885.

Total distilled spirits.—\$1,850,353.

Tobacco.—Unmanufactured, \$252,258,902 lbs., valued at \$21,924,337; total of all sorts, \$26,990,073.

Wood and Manufactures of.—\$37,513,252.

Wools and Manufactures of.—\$1,089,632.

Total Value of Domestic Exports.—\$1,210,291,913.

An abstract of official reports, published in October, 1898, showed the increase of the export trade throughout the world during the decade from 1886 to 1896. The abstract shows that while the total exports of the twenty-two leading countries of the world rose from £1,157,000,000 in 1886 to £1,387,916,000 in 1896, an increase of 20 per cent. in the decade, the United States export trade showed an increase of 30 per cent. Thus the United States increased 10 per cent. more rapidly in her trade than the average country of the group, and when her trade is compared with the trade of her principal rivals, France, Germany, and Great Britain, her relative increase was even greater, for Germany's exports increased but 13 per cent., those of Great Britain 10½ per cent., and those of France only 4½ per cent. An estimate placed the total commerce of the world in 1898 at \$17,000,000,000, in round numbers, of which the United States contributed about \$1,848,000,000, or nearly 11 per cent., as compared with 7½ per cent. in 1870. Certain staple products of the United States show a still greater rate of increase; for instance, iron and steel increased more than 150 per cent., and an increase of nearly 100 per cent. appeared in our exports of leather and its manufactures. In respect to these three commodities the commercial rivals of the United States have shown no such advance. From 1887 to 1896 the exports of iron and steel from the United Kingdom actually fell off 5 per cent. The exports of leather from France and from Germany fell off to an even greater extent and those from Great Britain showed a gain of less than 5 per cent.

INCH, PHILIP, Chief Engineer, U. S. N., retired, died at Saratoga, New York, October 18, 1898. He was born in the District of Columbia in August 1836; entered the navy as third assistant engineer in November 1857; served on the *Roanoke*, and in 1860 was promoted second assistant engineer and assigned to the *Pawnee*. He was present at the bombardment of Fort Sumter, the first battle of Bull Run, the destruction of the Norfolk navy-yard, the naval fight at Matthias Point, the engagement at Aquia Creek, and was with Colonel E. E. Ellsworth when the latter was killed at Alexandria. He was made first assistant engineer in 1861 and chief engineer in 1863, and was retired in August, 1898.

INDEPENDENT ORDER OF GOOD TEMPLARS, a mutual benefit society with 100 grand lodges all over the world and a membership of 391,601. The juvenile branch numbers 148,687. On becoming a member a pledge must be taken to abstain from spirituous and malt liquors, and to discourage their use in others, and in all legitimate ways to discourage their manufacture and sale. The next biennial meeting of the International Supreme Lodge will be held at Toronto, Canada, June 14, 1899. R. W. G. Secretary, B. F. Parker, Milwaukee, Wis.

INDEPENDENT ORDER OF ODD FELLOWS, a provident association founded in Manchester, England, in 1812, the object of which is to render assistance to members in trouble of any kind. It was authorized in the United States in 1819, but soon became independent of the English society. The American society supports 19 Widows and Orphans' Homes, which cost \$401,954. There are Rebekah lodges for women with a membership of nearly 300,000. There are subordinate lodges in many other countries. In 1897 there were in the United States 1,240,384 members of the

organization; annual disbursements \$3,364,629, revenue \$8,846,259; number of grand lodges 55; subordinate 11,229. In 1898-9 the Grand Sire was A. S. Pinkerton, Worcester, Mass. The next meeting of the sovereign grand lodge will be in Detroit, Mich., Sept. 18-23, 1899.

INDEPENDENTS, or CONGREGATIONALISTS, stand in England next to the Methodists, and are the most ancient community of English dissenters. They date from Queen Elizabeth's time. There are now 51 county and other associations in England and Wales with 4,618 churches and preaching stations with 1,636,032 sittings; 2,881 ministers. Chairman, Rev. H. Arnold Thomas, Bristol; Secretary, Rev. W. T. Woods, Memorial Hall, Farrington street. The report for 1898 shows the Independents to have in the United States 15 churches, 8 ministers, and 2,569 members.

INDIA, BRITISH, a dependency of Great Britain, including those parts of Hither and Further India which are under the administration of the Viceroy or Governor-General of India. The following table taken from the *Statesman's Year-Book* for 1898 shows the population of the British possessions in 1891 and the population per square mile:

British provinces.	Pop. in 1891.	Pop. per sq. m. in 1891.
Ajmere	542,358	200
Assam	5,476,833	112
Bengal:—		
Bengal	38,277,339	543
Behar	24,393,504	552
Orissa	4,047,352	411
Chota Nagpur.....	4,628,792	172
Total Bengal.....	71,346,987	471
Berar	2,897,491	164
Bombay Presidency:—		
Bombay	15,985,270	207
Sind	2,871,774	60
Aden	44,079	...
Total Bombay.....	18,901,123	151
Burmah:—		
Upper	2,946,933	35
Lower	4,658,827	53
Total Burmah.....	7,605,560	44
Central Provinces.....	10,784,294	125
Coorg	173,055	109
Madras	35,630,440	252
N. W. Provinces and Oude:—		
N. W. Provinces.....	34,254,254	411
Oude	12,650,831	552
Total united Provinces.....	46,905,085	436
Punjab	20,866,847	189
Quetta, etc.....	27,270	...
Andamans	15,609	...
Total British Provinces.....	221,172,952	229

Government.—The control of Indian affairs is vested in the Secretary of State for India, a member of the British cabinet, and in a council of fifteen members. In India itself, the executive authority is vested in the Viceroy, or Governor-General, appointed by the crown and acting under the authority of the Secretary of State for India. He is assisted by a council of five ordinary members appointed by the crown, and of the commander-in-chief as an extraordinary member, each in charge of an executive department. There is a legislative council which consists of the members

of the executive together with from ten to sixteen members nominated by the Viceroy. British India was formerly divided into the three presidencies of Bengal, Madras, and Bombay. At present it is administratively divided as indicated in the preceding table, but the name presidency is still given to each of the provinces of Madras and Bombay. The presidencies of Madras and Bombay are each ruled by governors appointed by the crown and assisted by legislative and executive councils like those of the Governor-General. In regard to important matters they communicate with the home government through the Governor-General, but in matters of minor importance they may correspond directly with the Secretary of State for India. Bengal, the Northwest Provinces (with Oude), and the Punjab are each under a Lieutenant-Governor and the first two have legislative councils. In the other provinces there are no councils and the administrator does not possess any legislative powers. In three of them, namely, Assam, the Central Provinces, and Burmah, the government is in the hands of chief commissioners. Others are under the direct administration of the Governor-General. The Governor-General in 1898 was the Right Hon. George N. Curzon, who was elected to the peerage in that year under the title of Lord Curzon of Kedleston, and who embarked for India in the autumn of 1898.

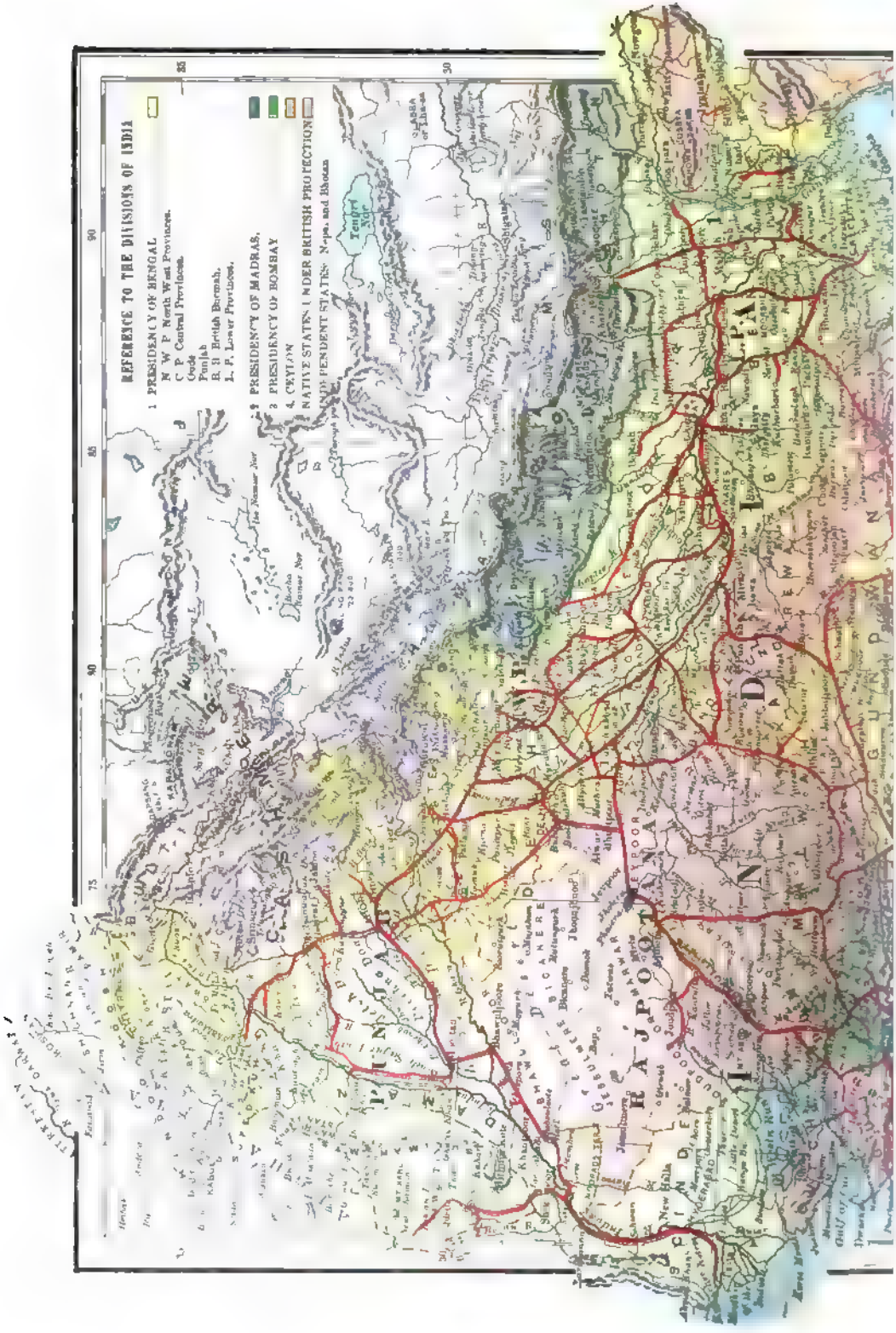
Army.—Since 1893 the Indian military service has been divided into four commands, namely, those of Bengal, Madras, Bombay, and the Punjab. The total strength of the British forces in India on January 1, 1898, was 74,623. In addition to this the native army numbered about 148,000 men. There are also some 30,000 volunteers enrolled and a fine reserve of native troops, known as the imperial service troops and numbering about 19,000 men.

Justice and Crime.—There are high courts of justice (from which appeal may be had to the privy council) in Bombay, Bengal, Madras, and the Northwest Provinces. The Punjab has a chief court with five judges and the Central Provinces, Oude, and Sind have each a judicial commissioner. Burmah also has a judicial commissioner as well as a recorder. In Assam the highest judicial tribunal is the high court at Calcutta. In 1895 the police numbered 147,094; the number of persons convicted in criminal cases was 845 and the number of prisoners in jail was 101,182.

Revenue, Expenditure, etc.—In 1896-7 the revenue was £62,753,160, and the expenditure £63,889,840; according to the estimates for 1897-8 the revenue was £64,374,000, and the expenditure £67,963,000; according to the estimates of 1898-9 the revenue was £66,057,000, and the expenditure £65,463,000, all these figures reckoning the rupee at 1s. 4d. The most important item of expenditure is the maintenance of the army. The budget estimate for 1897-8 gave this as Rx24,195,500. The most important items of revenue are land, railways, salt, opium, the excise, customs, stamps, and provincial rates. According to the budget estimates for 1897-8, out of a total revenue of Rx95,675,800, the land revenue was estimated at Rx25,646,200. For the year ending March 31, 1897, the revenue derived from opium amounted to Rx6,409,100 and the budget estimate for the year 1897-8 placed it at Rx5,816,200.

Currency.—The monetary unit of India is the rupee which was valued in United States currency on October 1, 1898, at 20.7 cents. Formerly the country, as is well known, was on a silver basis. For several years previous to 1893 the financial difficulties of the government had increased. The government was under great expense for public works and was a large borrower in the European market. The debt thus incurred had to be paid in gold but the revenues of the government were received in silver rupees, and as silver fell in value it became more and more difficult for the government to pay its gold obligations. Taxation, which was suggested as a remedy, was thought to be impolitic as conducive to riots, and at last the government resolved to close the mints to silver. This was done by the law of 1893 which provided at the same time that when silver coin, owing to its scarcity, should rise to the rate of 1s. 4d. per rupee, the mint should be again opened to the coinage of silver at that price. The currency history of the country since then is differently interpreted by monometallists and bimetallists, the former pointing to the advantages gained by the Indian government as a result of this law, and the latter to the hardships to the people resulting from the consequent appreciation of the silver rupee. There can be no question that the Indian government has profited so far as its financial balances are concerned by the law of 1893. The difficulty of making gold payments has greatly decreased. In official circles in India there has been no disposition to return to the silver standard and their attitude is illustrated by the reply made to the proposal of the United States Commission which was sent to Europe in 1897 to sound the opinion of foreign countries in respect to a bimetallist programme. See the article **BIMETALLISM**.

On the other hand the native producer is said to have suffered from the rise in the value of the rupee, since when he turns the gold which he receives in the market in payment for his goods into rupees, he finds the profits smaller than they were before the mints were closed to rupees. The result is said to be the checking of the



REFERENCE TO THE DIVISIONS OF INDIA

- 1. PRESIDENCY OF BENGAL
 - M. P. North-West Provinces.
 - C. P. Central Provinces.
 - Punjab.
 - B. N. British Burma.
 - L. P. Lower Provinces.
- 2. PRESIDENCY OF MADRAS.
- 3. PRESIDENCY OF BOMBAY
- 4. CEYLON
- NATIVE STATES UNDER BRITISH PROTECTION: Nepal and Bhutan

75 85 90

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flow of capital from Great Britain to India. On these grounds the opponents of the government say that the policy exemplified by the law of 1893 has been injurious to the country as a whole, and some of them even attribute the recent Indian famine mainly to currency troubles. The poorer classes are said to have lost heavily through this cause. The reopening of the mints is urged as the only remedy. The popular discontent and the representations of men prominent in commercial affairs led in the spring of 1898 to the appointment of a departmental committee for the investigation of the Indian currency. The chairman of this committee was Sir Henry Fowler, and among the members were Lord Balfour, Sir David Barbour, Sir John Muir, Sir Charles Crosthwaite, etc., who were expected to report in the spring of 1899. Many do not believe that the opening of the mints to silver is at all desirable. For instance, Lord Northbrook, formerly Viceroy of India, writing in November 1898, denies that the closing has seriously injured any interests in India, outside the money market, or has caused the increase of taxation. Nor does he believe that the gold standard would be unpopular in India. He would have the sovereign made legal tender in India at the rate of 1s. 4d. per rupee, and he does not think the cost of establishing gold coinage would be excessive or that gold would flow from India in consequence. Paper money is issued by the Department of Public Issue which has established circles of issue in which the notes issued are legal tender. The value of notes in circulation on March 31, 1897, in tens of rupees, was Rx23,753,307. In the year ending March 31, 1896, the total debt, including the unfunded debt in India and the permanent debt in England was Rx232,339,028, and in the following year the public debt was Rx114,862,983 in India and £107,404,143 in England.

Railways.—The railway lines are divided into those which are owned and worked by the state, those which are owned by the state and worked by companies, lines worked by guarantee companies, lines worked by assisted companies, and lines owned by native states. On March 31, 1897, the total mileage open for traffic was 20,390, of which 10,238 were state lines worked by companies.

Agriculture.—The chief occupation of India has always been agriculture and since 1870, the government has made especial efforts to introduce improved methods and increase the production. The chief crops are rice, wheat and other food grains, oil seeds, cotton, sugar cane, tobacco, and tea. The largest crop grown is the rice crop, which furnishes the staple article of food. According to a consular report published in March 1898, the average yield of the crop for the ten years ending in 1897 was about 410,000,000 hundred weights, of which the amount exported was valued at about \$35,000,000 annually. The crop of 1895 was deficient, especially owing to the falling off in Bengal which usually raises about three-fourths of the crop of all India including Burmah and in 1896 the yield was three per cent. below that of 1895 and six per cent. below the average. In 1897 it appeared that the average had not only been reached but had been surpassed by about six per cent. The wheat crop is especially important because India supplies wheat to the markets of the United Kingdom and to the continent of Europe. During the ten years ending in 1897 the exports of wheat, however, appear to have largely contracted. The crop for the seasons 1897 and 1898 promised well in northern India but not in Bombay and Berar. A fair crop was expected in the Central Provinces. In the summer of 1898 there was a decrease in the area devoted to the cultivation of jute in the province of Bengal and it was estimated that the total year's yield would amount to about 90 per cent. of the normal crop.

Manufactures.—Manufacturing is of considerable importance in India, although agriculture is the main occupation. Among the most important Indian products are cotton, silk and jute articles, and various articles of luxury including fine textile products and highly wrought work in ivory and precious metals. In 1895-6 there were 147 cotton mills in operation in India. Coal mining is also important and in 1896 the collieries in operation numbered 172. (See COTTON AND THE COTTON INDUSTRY.)

Commerce.—In 1897 the principal countries to which Indian products were exported were, in the order of their importance, the United Kingdom, China, Germany, France, Straits Settlements, Egypt, the United States, Japan, Ceylon, Belgium, and Italy, and in the same year the leading countries which imported into India were in the order of their importance, the United Kingdom, Belgium, Germany, China, Russia in Asia, Straits Settlements, Mauritius, Austria-Hungary, and the United States. The leading articles of export in 1897 were rice, cotton, cotton manufactures, jute and jute manufactures, opium, seeds, hides and skins, tea and indigo, and the chief articles of import were cotton manufactures, metals and metallic goods, sugar, oils, machinery, railway plant, and rolling stock, silk, etc. An American consul in Great Britain reported in 1898 that the trade of the United States was competing vigorously with that of the United Kingdom in India. In kerosene oil the American trade is especially large, although it has latterly encountered severe competition from Russia. In 1897 it was reported that the trade of

the United States exceeded \$15,750,000, nine-tenths of the imports being kerosene oil. The exports from India to the United States in that year was said to be five times the value of the imports and they composed chiefly hides and jute. A great benefit was expected to result to the trade of the United States with India from the establishment of a line of steamships between New York and India, touching at Bombay and Calcutta. The announcement of the establishment of the new line was made at the beginning of the year 1898 and it was expected that the facilities which it would give to the manufacturers for direct communication to India without transshipment would increase their profits and promote trade. The trade of the United States with Calcutta is especially important. In the year ending March 31, 1898, the total trade increased 30 per cent. over that of the previous year, this increase being due wholly to the exports from India to the United States. The chief products exported to the United States were jute, raw and manufactured, hides, skins, indigo, flax, saltpetre, tea, caoutchouc, and seeds. The American consul-general at that port reported a decline in the trade with the United Kingdom and with France and Russia but an increase with the United States, Austria-Hungary, Italy, and Belgium. Efforts have been made to promote the trade in cotton manufactures with India, especially with Calcutta which is the distributing point for Bengal, a province which imports more than all the other provinces put together.

Language, Religion, and Education.—In the census of 1891, 118 linguistic groups were recognized. Of these the Hindoo was the most important, being spoken by 85½ per cent. of the population. The English language was spoken by 238,499 persons, although the number of British born in India, according to the census of 1891, was only 100,551. The prevailing religion is the Hindoo, being that of about three-fourths of the population. The Mohammedans numbered 57,321,164 in 1891. Next in importance came the group of religions classified in the census of 1891 as Animistic, numbering 9,280,467, and next the Buddhists, numbering 7,131,361, of whom the great majority were in Burmah. The number of Christians was estimated at two and one-quarter millions. There are five universities in the educational system of India, the universities of Calcutta, Madras, Bombay, the Punjab, and Allahabad. On March 31, 1896, there were 152,841 schools and colleges, attended by 4,303,109 scholars, of whom only 397,103 were girls.

HISTORY.

In 1898 and the two years immediately preceding India suffered many misfortunes. Besides famine and plague over vast tracts of country, there were in the north the ravages of war, while political discontent was always manifest and actual sedition often on the point of breaking out. In the year 1898, the main interest in the history of India is centered in these topics, namely, the plague, the riots and seditious movements that resulted from the popular discontent, and finally the difficulties on the frontier.

The Plague.—In the beginning of 1897, the famine and plague were ravaging the Northwest Provinces, Oude, and the Punjab and had made great progress in the Central Provinces, Bombay, Madras and Berar, including areas on which the population aggregated 80,000,000. Conditions grew worse and soon starvation faced the natives in a tract of land 1,300 miles long and 400 miles wide and it is estimated that over £1,000,000 were employed by the government for the alleviation of the suffering. In October 1897, it was reported that the total cost of the famine was over \$50,000,000, of which nearly \$7,500,000 had been subscribed by people of English speaking countries. The plague followed in the track of the famine, being caused to a great extent perhaps by the lack of food. The famine which began in 1896, seemed to have passed its worst stage by the summer of 1897, but the plague continued to ravage certain districts of India until the close of the year 1898. It made its appearance in the presidency of Bombay in August 1896, and from there it was rapidly carried to many of the other districts. In June 1897, it seemed to be dying out, but reappeared in the autumn and continued with increasing virulence until February, 1898, when the death rate reached its maximum. After that it abated and in June 1898, the death rate was again normal, but in the following month there were signs of another recrudescence. Between September 1896 and April 22, 1898, the number of plague cases in Bombay were reported as 29,062 of which 23,339 were fatal; a mortality of 90.2 per cent. In other plague-stricken districts the percentage of deaths was not so high, Bombay being one of the most densely settled cities in the world and containing a large number of unsanitary tenements. Another city which suffered severely from the plague was Poona with a population of 130,000. Its unpaved streets, open gutters, and unventilated houses made it difficult to check the spread of the disease. The plague increased there from July to December 1897 and at one time the number of deaths averaged 100

a day. Surat, Karachi, and Sholapur also suffered severely from the plague. In none of the plague-stricken districts could the whole number of deaths be ascertained, because thousands of the natives reported some other cause of death or buried the bodies secretly, making no report at all. In August the plague reappeared in the Bombay presidency and during the last week of that month over 2,300 deaths were reported, of which 162 occurred in the city of Bombay. Some cases were also reported in the Madras presidency and a few in Calcutta, which, however, was officially declared to be free from the plague on October 10, 1898. By November the plague in the city of Bombay was on the decrease, but throughout the presidency its ravages were still severe.

Nature of the Disease.—The plague is an infectious, febrile disease, caused by a micro-organism in the blood, which was discovered by Kitasato in 1894. There are two distinct types of the disease: the pneumonic, in which pneumonia is usually the chief symptom; and the bubonic, which is characterized by an enlargement of one or more groups of the glands. The latter was the type prevalent in India. The disease is often attended by delirium, and if patients are not watched, they are liable to rise and roam about. This accounts for so many deaths by the roadside. Recovery from the plague is slow and one attack does not prevent another. It is thought that the disease was spread by the means of clothing, animals, insects, etc., and the manner of infection seemed to be by skin abrasion and through the respiratory tract. The serum inoculation of Dr. Haffkine lessened the liability to attack and increased the likelihood of recovery if attack came. The Yersin serum was not so successful. See PLAGUE.

Relief Measures.—The investigation committees appointed by the English authorities to discover houses where cases of the plague were being concealed, encountered great difficulties in staying the progress of the disease on account of "caste prejudices, superstition and fatalism, native ignorance and distrust of all sanitation, the dishonesty of many native officials, combined with the natural genius for misrepresenting the government's orders to suit their own ends, and the existence among the natives of a free masonry, which enables them to conceal sick or dead friends in a truly wonderful manner."

With a decline of the epidemic in June 1897, house inspection was given up, but was resumed when the disease again increased. The duties of the investigation committees, which were finally obliged to accept military aid, were many and very difficult to perform. They consisted of: "searching for and removing to the hospital all cases of the plague; transferring friends and relatives who had been in contact to Segregation Camp; supervising the disinfection and white-washing of the infected houses, and when required making a window in rooms not possessed with that luxury. The census of persons in each ward [of the city] was kept by the officer in charge. On the walls of an infected house, the search party painted date, number of attacks, and deaths, for future reference. Every house was visited in turn; but there is no doubt that many cases eluded the vigilance of the soldiers." There was also a system of railway inspection. Hospital service in November and December of 1897 reached a surprising number of cases, but was insufficient. The natives mistrusted and feared the hospital. One of the main objects of the sanitary work has latterly been the destruction of rats which are thought to be one of the chief causes of the disease. It was found that a great mortality among rats preceded the outbreak of the plague, and when the bodies of the rats were examined they were found to contain the bacillus of the disease. This was thought to explain the fact that the contagion seemed to cling to certain houses no matter how thoroughly they were disinfected. Cases occurred in which houses had been disinfected and then shut up for a long period of time, and yet when afterwards occupied the inmates developed the disease. It was therefore presumed that the germs were communicated by the rats that continued to infest the premises. It was noted that very few of the attendants employed in plague duty caught the disease nor did it manifest itself among the friends of the patients when the former attended the hospitals. On the other hand there was a remarkable manifestation of the contagious nature of the disease at Vienna where the members of the Austrian Plague Commission from Bombay were studying the disease in a laboratory constructed for the purpose. Rats and guinea pigs were inoculated with cultures brought from India. Soon one of the attendants developed the genuine bubonic plague. His death was followed by that of Dr. Mueller of the Plague Commission, and by the death of one of the latter's nurses.

The Riots.—In prosecuting their duties the investigation committees were compelled to violate many of the manners and customs of the natives, for example, the inspection of the Zanan Khana, or female apartments, and the sacred place called the Shrine. The persistent efforts of these committees precipitated the great riots which occurred in the early part of 1898.

It was only in rare cases that the natives could be reasoned with or be shown that

the British government was working for their ultimate good. A hatred therefore of the Europeans became prevalent among the natives at Bombay, and rioting occurred on January 29. The largest riot occurred in Bombay on the 9th of March; its rise was sudden and its spread rapid. It was directed towards Europeans, because they supported the government in its effort to enforce sanitary laws respecting the plague. The riots began on the Ripon by an attempt to keep searchers from inspecting some tenement houses, where afterwards 25 cases of plague were found. The rioting was severe and resulted in not a little damage but was suppressed by the police and the soldiery. It was found later that the riots of March 9 were premature, and that there was a general plan for a simultaneous uprising two days later, in which the massacre of as great a number of Europeans as possible would take place. By the precipitation of the riot before the appointed time a much more severe disturbance was doubtless evaded. After the rioters were suppressed, still full of the spirit of discontent, they went on strike. Shops were closed, and coolies, porters, and railway men refused to work, hoping thus to cut off the Europeans from necessary supplies. The position of the government at this time was very difficult.

The Frontier War; its Origin.—For several years there has been a dispute over the Afghan boundary, and it has been a difficult task to delimit the frontier in such a way as should satisfy the claims of Great Britain, Russia, and Afghanistan. According to the delimitation of 1895, Russia acquired the territories of Darwaz, Roshan, and Shighnan. In 1893 a convention was formed between Sir Mortimer Durand, the representative of British India, and the Ameer of Afghanistan, concerning the respective limits of Afghanistan and British India. To the British sphere of influence Bajaur, Chitral, Swat and Chilas were added by this agreement. The boundary line, however, cut through the Mohmand tribe, leaving one half under the jurisdiction of the Ameer, and the other under that of the Indian government. Quarrels among the members of this tribe led to the interference of the Ameer, whose troops occupied an outpost in the Mittai valley, which by the terms of the Durand convention, was in the British sphere of influence. Alarmed by this movement of the Afghan troops, the British government had to take action in its own defence, and in January 1897 the British representative declared that the country of the Mohmands was wholly within the limits of the British territory. The fear of British annexation, combined with religious fanaticism, provoked the border tribes to revolt. The Ameer's course was suspicious, but he was ostensibly loyal. In May 1897 he withdrew his troops, which had been occupying the Mittai valley. The Mohmands were now in more dread than ever of British aggression, and awaited merely a favorable chance to break out in open revolt. The relation between the tribes on the border is such that the revolt of one is apt to be followed by sympathetic movements on the part of the others. All were alarmed at the recent accessions of territory to British India.

Military Operations in 1897.—In the early summer of 1897, there were only about 12,000 British troops stationed at the frontier, and as these were scattered, they did not form a sufficient guard. The mullahs, or religious teachers, inflamed the passions of the natives, and preached that the doom of the British was near at hand. The tribe inhabiting Waziristan attacked a British frontier force on June 10, 1897, and inflicted a serious loss. This was punished by an expedition under Major-General Corrie Bird, who with a force of 6,000 men laid the country waste. But the revolt soon spread to Swat, where the inhabitants rose against the British toward the end of July. They fought with courage and the fort of Malakand narrowly escaped falling into their hands. The revolt was started and led by a fanatical preacher known as "the Mad Mullah," and the tribesmen showed desperate courage as well as considerable skill in marksmanship. The British suffered severely for they were outnumbered, and in some instances taken unawares. Another priest a Hadda mullah who exercised great influence over the Mohmands, collected a considerable army with a view to joining in the attempt to capture the fort at Malakand. He arrived too late, but fought a sharp battle at Shabkadra fort with the British, by whom he was repulsed in a cavalry charge with a loss of several hundred soldiers. It was believed that the Ameer of Afghanistan secretly connived at this revolt. The troops of the regular Afghanistan army were seen among the rebels, and it was thought that the Ameer's general was in constant communication with the leaders of the revolt. But when the British government remonstrated with the Ameer, he disclaimed having taken any part in the revolt, and he forbade the Afghans to join the insurgents. Another rumor at the time pointed to an understanding between the Ameer and the Sultan of Turkey, but this was not proved and the Sultan disclaimed any interest in the affair. The spirit of the revolt spread to the other tribes of the border, among them the Orakzais and Afridis, who could together muster over 40,000 men. These tribes were good fighters, and they occupied a region in which

military operations were difficult. In midsummer, 1897, the mountain tribes along the border for a distance of 600 miles had risen against the British, or were on the point of doing so. The Afridis, after some sharp fighting, gained possession of the entire Khyber pass.

The Autumn Campaign, 1897.—In September 1897 the English assumed the offensive. The conduct of the Afridi campaign was intrusted to Sir William Lockhart, who left England to assume the command. Upon a display of force by the English, the Ameer became more active in his attempts to check the rebellion, and he received assurances from the British government in India that there was no design of seizing any of his territory or suppressing the independence of the Mohmands. It is not possible here to narrate the details of the campaign, or to describe all of the engagements. The magazine gun transformed the method of warfare, making it possible for the British to repulse a charge at the outset, and as a rule, the tribesmen abstained from the fierce charges which had characterized their fighting in former years. There was some severe fighting during September and the village of the Hadda mullah was destroyed. The general advance against the Afridis was not undertaken until October. By that time, the troops under British command numbered about 70,000 men, a larger force than had ever before been concentrated on the frontier. The Afridis offered certain conditions of submission, but the Indian government declared its intention to punish them on account of their bad faith in breaking the alliance, for they had agreed to act as guardians of several forts and passes on the frontier. The Ameer also condemned their action, and declared that they deserved severe punishment as rebels. There were many Afridis employed in the British army, but although they were reckoned as the best soldiers, they deserted whenever they had the chance. While in the British service they improved their opportunity by stealing many of the breech-loading rifles. For a long time before the revolt, British officers had remarked the mysterious disappearance of these rifles at frontier posts, and many of them were afterwards found in the possession of the rebels. A fierce battle was fought at Dargni on October 20, when a division of the British Indian army, consisting of English, Scottish Highlanders, Gurkhas and Sikhs, tried to dislodge several thousand of the tribesmen from an advantageous position, which was shelled by batteries. The attacking party was successful after a hand-to-hand fight, but lost 195 officers and men. In this advance remarkable bravery was shown by the Gordon Highlanders. As they started to charge one of the Scotch pipers named Findlater was shot through both legs but managed to prop himself against a rock and continued to play the "Cock o' the North." His heroism was for some time the talk of the London newspapers. He was afterward invalided and sent to England, where early in the following year army circles were horrified by the report of his engagement to play his tune in one of the London music halls. From this, however, he was dissuaded and the manager of the music hall was induced to cancel the engagement.

Under Sir William Lockhart matters improved, for he was one of the ablest Indian fighters in the British army. He outmanoeuvred the tribesmen at Sempagha pass on October 30, and routed them with but slight loss to his own force.

The Issue of the 1897 Campaigns.—Early in November, having penetrated into the heart of the Afridi country, Sir William Lockhart announced the terms of peace. From the Orakzai clans that had taken part in the revolt, he demanded the surrender of 500 breech-loading rifles, the payment of a fine, and the rendering of submission within a fortnight. The Orakzai tribe was ready to submit, but the Afridis still held out. Early in November, when General Westmacott was reconnoitering in the Afridi country, one of his regiments was followed up, and attacked while holding a very disadvantageous position. It suffered considerable loss, and was saved only by the courage of the Sikhs. This same Sikh regiment afterwards rescued another body of the British Indian army which was suddenly exposed to a severe attack by the Afridis, when it was detached from the main force. In this kind of fighting the native allies are said to have been more skillful than the British troops. They showed greater alertness and power of endurance. The Afridis profiting by the knowledge which members of the tribe had derived from service in the British Indian army, showed unusually good discipline and a high degree of military skill. Above all they were remarkable in their marksmanship, and it is said they could pick off troops at a distance of one thousand yards. Their skill in marksmanship is further attested by the greater proportion of casualties among the British officers than among the men. The terms which the government sought to impose upon the Afridis were the forfeiture of the tribal allowance, which had been given them in return for protecting the frontier, the rebuilding of the forts in the Khyber Pass which they had destroyed, and the acquiescence in any disposition which the government might make in regard to the reopening of that pass. A week was given them in which to make up their minds. On November 18th the main camp in the Afridi country was broken up, and the British forces retired. They were harassed

on their return by the Afridis and met with considerable loss. These are the main events of the campaign of 1897. The loss to the British Indian army has been placed at 433 killed and 1,321 wounded, of whom 36 killed and 81 wounded were British officers. The native troops in the British Indian army being more numerous, suffered heavier loss than the British troops.

Troubles on the Frontier in 1898.—During the early part of the year 1898 troubles on the frontier continued. In December, 1897, General Sir William Lockhart established his army in winter quarters on the northwest frontier. At this time the Zakka-Khels were holding out and were harassing the British forces at every opportunity. The British troops exacted a heavy penalty for these raids and destroyed a number of the villages and strongholds of the tribesmen. On December 28, 1897, it was officially announced that the British army had returned from Khyber Pass after having punished effectively the recalcitrant Zakka-Khels. It was stated that the military operations on the frontier were now at an end and that every district in the Afridi and Orakzai valleys had been visited. The enemy's loss was reported as severe and out of all proportion to their fighting strength. The Orakzais were said to be completely humbled and the Afridis were reported to be on the point of submission. A month later, however, it was rumored that a body of British troops was nearly cut to pieces by the Zakka-Khels. The British had devised a plan for cutting off the retreat of the tribesmen who had driven their cattle down to winter pasturage, but the Zakka-Khels in their endeavor to force their way out, attacked the British in the Bazar valley. The natives fought desperately and inflicted a heavy loss. It was especially severe among the British officers. The British recaptured the position from which they had been dislodged and afterwards avenged their losses by successful attacks upon the enemy. Nevertheless the general effect of the first reverse was humiliating, for the British had had long experience in this mode of warfare and their lack of success was attributed to military blunders.

Criticism of the Government.—In England there was some sharp criticism of the general policy of the government in respect to the frontier difficulties and of its method of conducting the military operations of 1897-8. On February 14, 1898, an amendment to the address was moved in the House of Commons disapproving of the policy of the government in occupying Chitral and maintaining and fortifying the road through the territory of the independent tribes. This resolution declared that the best policy for the government to pursue was to recognize the independence of the frontier tribes. The policy followed by the Secretary of State for India was said to be a violent reversal of the established policy of the government in the matter of the Indian frontier. There followed a long debate between the critics and defenders of the government's policy. On February 10, Lord George Hamilton, Secretary of State for India, published a dispatch to the Viceroy reviewing the whole situation. He assigned fanaticism as the principal motive of the outbreak of the tribes, which were stirred up also by the delimitation of the frontier in accordance with the Cabul agreement. He declared it to be his belief that roads in the border territory should be properly guarded. He criticized the temporizing policy of the government in the past and the unwillingness of the people to accept the full responsibility for the maintenance of peace on the frontier. Great Britain, he declared, had become responsible for the protection of the Ameer's territory. The border line should be thoroughly guarded and the government should always be ready to concentrate its troops in case of attack. Financial considerations had interfered with this and the policy of the government had been mistakenly lenient, he maintained, in permitting no interference with the affairs of the outlying tribes. Lord Roberts of Kandahar on March 7, 1898, referred to the enormous fighting strength of the tribesmen of the Afghan frontier, estimating it at 200,000. He characterized the system of non-interference with the frontier and especially with the Afridis as a failure. He said that the recent outbreak had not been caused by the "forward" policy but by a too lenient or too negligent policy. He urged that some vigorous measures should be taken and declared that the occupation of Chitral was imperative.

As to the military operations themselves, it was said by some that they had been badly managed. It was hinted that the British troops in certain circumstances had shown a lack of pluck having refused to rescue wounded comrades under fire. At the Thirteenth National Congress of India held in Amraoti in December, 1897, the policy of the government on the frontier was condemned, especially in requiring the native government to bear the expense of what was characterized an imperial movement in accordance with the so called "forward" policy of the home government. The appointment of Mr. George Curzon (now Lord Curzon of Kedleston) as Viceroy of India was regarded by some as a sign that the "forward" policy would be continued. This view was based partly on the statesman's youth and partly on the radical attitude that he had maintained toward the eastern questions. It was taken as a sign that a vigorous policy would be adopted in the east. In his work

on Persia he declared his conviction that a vigorous and anti-Russian policy was inevitable if England would preserve her power in the east.

Apart from military matters the government was criticized by some writers for injustice towards the natives. A writer in the *Westminster Review*, for instance, cites among other abuses the payment of rupee salaries to officials, counting 2s. 3d. to the rupee when in ordinary exchange the rupee is worth but a little more than a shilling. Again, it is said that the government employed ill-advised methods in dealing with riot and rebellion; that, for instance, seditious publications were not speedily suppressed and punishment for sedition was often ridiculously light. Again, the interference on the part of the government with some of the traditions and customs of the people was regarded as unwise, as in the curtailment of the infant marriages (which are said to be only the betrothals or engagements), and of the marriage of widows—matters which unnecessarily aroused the fanatical opposition of the native leaders. Another point urged by the critics of the government was that too large a number of natives were employed in the army, and that the government had been impolitic in exempting the Afridi regiment from fighting against their tribesmen in the Tirah campaign of 1897-8, and in publishing the fact with the probable effect of sowing discontent among many native troops. It was thought that this precedent would lead to the exemption of other native regiments. Furthermore the government was blamed for massing native troops in regiments and companies of the same tribe, thus affording a chance for a formidable and concerted mutiny.

End of the Frontier War.—By the first of April the Zakka-Khels were subdued and they paid their fines and gave up their rifles. This virtually brought to an end the fighting in that district and the British forces there were now reduced in numbers. It was reported in September 1898, that traffic was renewed through the Khyber Pass where a British brigade held Landi-Kotal. Although a few of the Zakka-Khels retained the rifles that had been demanded, the general prospect was favorable. The Afridis acquiesced in the arrangement made in regard to the Khyber Pass. They were summoned to Peshawar toward the close of October 1898, and notified of the Indian government's intention to hold the Pass, to build forts at Landi-Kotal, Jamrad, and other places, and to control the surrounding territory. Outside of this the Afridis were to manage their own affairs, but in the Khyber Pass were to be responsible to the government. The usual allowances were to be continued provided that the Afridis were guilty of no misconduct. It was further said that a railway would be built through the Pass if necessary. The representatives of the Afridis accepted these terms and the settlement seemed to be entirely friendly and of a permanent nature.

INDIAN CONGRESS AT OMAHA. The Indian Congress at the recent Trans-Mississippi exposition at Omaha, from June to October, inclusive, of 1898, marked an era in American ethnology. On this occasion, for the first time in our history, the national government appropriated a considerable sum for the purpose of making an exhibit of the home life, arts and ceremonies of our aboriginal tribes. The result was sufficiently satisfactory to establish a precedent, so that we may expect to see the Indian exhibit a feature of future great expositions for some years to come.

The idea of a congress of Indian tribes originated with Mr. Edward Rosewater, proprietor of the *Omaha Bee*, and manager of the board of publicity of the exposition, and the successful outcome was largely due to his efforts. Upon the opening of Congress in the previous winter the management endeavored to secure a special appropriation of \$100,000 for the purpose, but the outbreak of the war with Spain made this impracticable, and the amount was finally reduced to \$40,000, which became available a month after the opening of the exposition. The administrative control was placed in charge of W. A. Mercer, of the Indian Department, while James Mooney, of the Bureau of American Ethnology, was detailed to supervise the ethnologic features.

Estimates were made for five hundred Indians, the intention being to bring delegations from different representative tribes and set them down upon the exposition grounds, each in their ordinary dwellings and carrying on their everyday affairs as at home. More than twenty tribes were represented, speaking as many different languages, among them being Apaches, Arapahos, Assiniboin, Blackfeet, Cheyennes, Chippewas, Crows, Flatheads, Kiowas, Omahas, Poncas, Pueblos (of Santa Clara), Sauks and Foxes, Sioux, Tonkawas, Wichitas and Winnebagos. The Sioux, the largest tribe in the United States, had also the largest representation at the congress, the delegations from their different reservations numbering in all about eighty persons. The Apaches were in two delegations, a part from the San Carlos reservation in Arizona, and the others from the Chiricahua band, now held under military restraint at Fort Sill, Oklahoma. Among the notables were Naichi and Geronimo of the Apaches, Tawaconi Jim of the Wichitas, and White Swan or Curly, the Crow scout, the sole survivor of the Custer massacre.

The majority of the Indians were housed in canvas tipis, which they brought with them, and several of which were painted and decorated in the old heraldic fashion, while one was of dressed hides sewn together with sinew thread. The Apaches occupied round-topped wikiups, while the Sauks were in wigwams covered and floored with finely woven mats of rushes. The Kiowas surrounded their principal tipi with a circular windbreak of leafy willow branches, after the style of the winter camps of the plain's tribes. The most unique dwelling structure of all was the grass house of the Wichitas—the people of the ancient Quivira—which Mr. Mooney bought upon the reservation from the family then living in it, and transported by rail to Omaha, where it was again set up by the Wichitas, fifteen of whom occupied it until the close of the exposition, when it was taken down and shipped to Washington to form a permanent attraction at the Columbian National Park.

No effort was made to give any presentation of native industries, but dances and other ceremonies proved an attractive feature. Among the most interesting were the Medicine dance, the Horn dance and the Ghost dance. A miniature camp circle, prepared by the Kiowa Indians under the direction of the Bureau of American Ethnology and now the property of the National Museum, was set up on the grounds to illustrate the former camping order of the plain's tribes. The complete circle consists of 250 miniature buckskin tipis, with shield, tripod and central medicine lodge, decorated and arranged as they were on the occasion of the last great historic gathering of the tribe in 1867 just previous to coming upon the present reservation. A series of five hundred Indian photographs in costume was also taken under supervision of the Bureau, forming an invaluable collection of Indian portraits.

INDIAN TERRITORY. Congressional Legislation.—In 1897 there was attached to the regular Indian Appropriation bill in Congress the provision "that on and after January 1, 1898, the United States courts in the Indian Territory shall have original and exclusive jurisdiction and authority to try and determine all civil causes in law and equity thereafter instituted, and all criminal causes for the punishment of any offense committed after January 1, 1898, by any person in said Territory." United States commissioners in the Territory were also given the full powers which the Federal laws provide that they shall exercise elsewhere. The Federal laws and those of the State of Arkansas that had been extended to the Territory were then made applicable to all persons, irrespective of race, and the right to serve as a juror in any of the courts was conferred on any citizens of the five tribal nations "otherwise qualified, who can speak and understand the English language." In January, 1898, Representative Curtis, under authority of a joint committee of Congress, prepared and introduced a bill "for the protection of the people of the Indian Territory," which was adopted by both houses and approved by the President on June 28. This legislation made many radical changes in the relations of the several tribes of Indians to the Federal government. A few of the changes are here summarized. The Curtis act provides for the extension of the jurisdiction of the United States courts so as to include all causes of action irrespective of the parties, and so as to give those courts jurisdiction to try certain suits by or against the several tribes. The enrollment of the tribes by the Dawes Commission is to be made conclusive as to the membership of each tribe, which will determine definitely the membership of the tribes and dispose of all questionable claims to citizenship. An allotment of lands in severalty to the members of the tribes is to be made by the Dawes Commission, so far as the use and occupancy of the lands may be concerned, all minerals being reserved for the benefit of the tribes. All tribal courts are to be abolished and all officers of them are prohibited from performing any act authorized by any law in connection with those courts. The enforcement of the laws of the various tribes by the United States courts in the Territory is prohibited. Provisions are made for the leasing of the mineral lands of the different tribes by the Secretary of the Interior, for the incorporation of cities, and towns, and for the termination of all grazing leases made prior to January 1, 1898, on April 1, 1899, and all farming leases of like priority on January 1, 1900. The bill furnishes a means whereby the "intruder" class may be dispossessed of lands held by them without right or title. An amendment relating to the claim of the Missouri, Kansas, and Texas Railroad Company to a grant of land in the territory occasioned much contention. The conferees agreed to leave the company's rights undisturbed. During the year the Choctaw, Chickasaw, and Seminole nations entered into agreements with the Federal government which in some respects modify the Curtis law, leaving the Cherokee and Creek nations subject to the original provisions.

Education.—There are no general reports concerning the schools maintained by the several nations. The Dawes Commission in 1898 called attention to the necessity of providing for the education of some 30,000 white children living in the territory and at a conference in Washington over territorial problems, it was decided to establish a complete public school system under a territorial superintendent at the earliest

practicable moment. The Federal government maintains a number of boarding schools on the reservations, and there are public high schools at Nelson and Tahlequah; private secondary schools at Atoka, Cameron, Chelsea, McAlester, Muskogee, Ryan, and Vinita, all denominational; and a Baptist university at Bacone and a Presbyterian college at Muskogee. In 1898 there were 70 periodicals, of which 5 were dailies and 62 weeklies.

Coal Production.—The most valuable natural product so far developed is coal. In 1896 the output exceeded that of any previous year, being 1,366,646 short tons; spot value \$1,918,115; and in 1897 it was 1,336,380 tons, value \$1,787,358. During the fiscal year ending June 30, 1898, mining was carried on by 20 companies, and the output rose to 1,458,098 short tons. See ASPHALTUM.

Banks.—On October 31, 1898, there were 14 national banks, with aggregate capital \$200,000, circulation \$204,718, deposits \$1,442,798, and reserve \$513,105, and 5 private banks, with capital \$80,000, deposits \$130,466, and resources \$241,493.

Railroads.—In 1896 the total railroad mileage was 1,182, and since then the extension of existing systems and the construction of new lines has nearly doubled that mileage. Congress was very liberal in 1897 and 1898 in granting rights of way across the territory for old and new roads, in extending the time for construction, under former grants, and in encouraging the building of short lines to connect the large towns. Railroad companies have to pay an annual tax of \$15 for each mile of road constructed through Indian lands and \$50 per mile for right of way. By act of Congress, June 4, 1898, all railroad companies operating lines through the Territory were authorized to lease the road and property of any company whose line may now or hereafter connect with its line; but the provisions of the act shall not apply to parallel or competing lines.

Finances.—In the fiscal year ending June 30, 1898, the income of the several nations from the funds held in trust by the United States treasury was as follows: Cherokee Nation, \$141,090.62; Chickasaw Nation, \$64,858.20; Choctaw Nation, \$63,853.16; Creek Nation \$142,460.05; and Seminole Nation, \$103,788—total, \$516,050.03.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 215,000, and that of the Five Civilized Tribes 77,018, including 17,457 freedmen. A number of enterprising towns are growing rapidly.

INDIANA, an east central State of the United States, with an area of 36,350 sq. m. Capital, Indianapolis.

Agriculture.—During the calendar year 1898, Indiana gained sixth rank in the production of corn and wheat. The following shows the production and value of the principal crops in the year: corn, 129,154,572 bushels, value \$32,288,643; wheat, 38,426,029, \$24,208,398; oats, 31,938,668, \$7,345,894; barley, 104,364, \$45,920; rye, 651,744, \$280,250; buckwheat, 94,318, \$48,102; potatoes, 6,672,864, \$2,735,874; and hay, 2,384,442 tons, \$13,352,875—total value \$80,305,956. Live-stock comprised, horses, 601,271; mules, 41,650; milch cows, 611,975; other cattle, 641,913; sheep, 674,532; and swine, 1,340,231—total head, 3,911,572.

Manufactures, etc.—During the fiscal year ending June 30, 1897, the collections of internal revenue on taxable manufactures aggregated \$8,564,363, the principal source being distilled spirits, \$7,702,252. In the year ending June 30, 1898, these collections amounted to \$10,022,274. The production of coal in the calendar year 1897 was the largest in the history of the State, aggregating 4,151,169 short tons, spot value, \$3,472,348. Clay, Sullivan, and Vigo counties were the largest producers, the former yielding 925,727 short tons. The clay industry had a total value of \$2,812,309, principally in brick and tile. In petroleum the yield was 4,122,356 barrels, value \$1,880,412; a decrease in a year of 558,376 barrels; rank of the State in production fourth. The State was surpassed by Pennsylvania only in the approximate value of its natural gas production, the figures being, Pennsylvania \$6,242,543; Indiana \$5,009,208. Quarrying operations yielded \$2,048,169, principally in limestone. In 1898 systematic operations were undertaken in Brown county to mine gold by machinery. The streams of the county have yielded \$40,000 worth of gold within a few years, and the hills are believed to contain valuable veins.

Commerce.—During the fiscal year ending June 30, 1898, the imports of merchandise at the delivery ports of Evansville and Indianapolis amounted in value to \$305,623, a decrease of \$32,634 in a year; exports, nothing.

Banks.—On October 31, 1898, there were 112 national banks in operation and 75 in liquidation. The active capital aggregated \$14,167,000; circulation \$5,947,987; deposits \$42,877,432; reserve \$17,163,593. State banks numbered 94, and had capital \$4,455,250; deposits \$11,637,935; resources \$17,257,157; surplus \$627,105. There were 4 loan and trust companies, with capital \$1,810,900, deposits \$2,032,300, resources \$4,059,420; 55 private banks with capital \$1,270,415, deposits \$5,165,353, resources \$6,686,129; and 5 mutual savings banks with deposits \$4,455,129, resources \$5,149,807, surplus \$599,432. The exchanges at the United States clearing-house at

Indianapolis in the year ending September 30, 1898, aggregated \$133,848,113, a gain of \$25,371,771 in a year.

Education.—At the close of the school-year 1896-7, the number of children of school-age was 749,902; enrolled in the public schools 551,073; daily attendance 402,747; number of teachers 15,052; buildings used for public school purposes 9,747, of which 84 were stone and 3,091 brick; total public school fund \$10,222,792; total expenditures in the year \$6,964,668, of which \$5,004,790 was for teachers' salaries. Revenue is derived from the public school fund, the Congressional township fund (\$2,470,064), local tuition fund, liquor licenses, and the dog fund. There were 345 public high schools; 26 private secondary schools; 3 public and 12 private normal schools; 14 colleges and universities, with 247 professors and instructors, 3,717 students, and \$486,691 income; 2 schools of technology; a college for women only; and 4 theological, 5 law, and 5 medical schools; Purdue University at Lafayette, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 850 periodicals, of which 150 were dailies, 588 weeklies, and 78 monthlies.

Finances.—The total assessed valuation of property in 1897 was \$1,289,191,713, and the State tax rate, representing the benevolent institutions, school, educational institution, general fund, and State debt sinking fund taxes, amounted to \$2.96 $\frac{2}{3}$ per \$1,000. The total State debt, March 1, 1898, was \$5,994,000, of which bonds for \$484,000 were held by Indiana and Purdue Universities and were not negotiable.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 2,525,000. Local estimates gave Fort Wayne 50,000; Indianapolis 185,000; Evansville 59,800; Terre Haute 44,000; Anderson 25,000; Muncie 30,180; and Hammond 15,000.

Events of 1898.—Early in the year the Indiana Labor Commission effected a settlement between the thousand workmen in the Elwood and Kokomo plate-glass works and the Pittsburg Glass Company. The articles were drawn up to cover a year. In March occurred the acquittal of Hezekiah Hughes, who was tried in Ripley county for complicity in lynching five men at Versailles in September 1897.

National Representatives and State Officers.—Representatives in Congress: James A. Heminway (Rep.), from Boonville; R. W. Miers (Dem.), from Bloomington; William T. Zenor (Dem.), from Corydon; Francis M. Griffith (Dem.), from Vevay; George W. Faris (Rep.), from Terre Haute; James E. Watson (Rep.), from Rushville; Jesse Overstreet (Rep.), from Indianapolis; George W. Cromer (Rep.), from Muncie; Charles B. Landis (Rep.), from Delphi; E. D. Crumpacker (Rep.), from Valparaiso; George W. Steele (Rep.), from Marion; J. M. Robinson (Dem.), from Fort Wayne; and Abram L. Brick (Rep.), from South Bend. Senators: Charles W. Fairbanks (Rep.), from Indianapolis and a Republican. Officials: James A. Mount, Governor; W. S. Haggard, Lieutenant-Governor; U. B. Hunt, Secretary; L. Levy, Treasurer; W. H. Hart, Auditor; W. L. Taylor, Attorney-General; F. L. Jones, Superintendent of Instruction; W. S. Blatchley, Geologist; and J. B. Conner, Chief of Bureau of Statistics. All are Republicans. Chief Justice, Leander J. Monks; Associates, James H. Jordan, A. Dowling, J. V. Hadley, and F. E. Baker; and Clerk, R. A. Brown. All are Republicans. There are 64 Democrats and 86 Republicans in the State legislature.

INDIANS OF THE UNITED STATES. *Population.*—Before the settlement of the country the territory of the United States, exclusive of Alaska, was occupied by some hundreds of native tribes and confederacies, of various degrees of importance, with an aggregate population of perhaps 600,000, of whom about one-third were east of the Mississippi. War, disease and famine, consequent upon the advent of the white man, have reduced them to about 240,000, the destruction having been greatest along the eastern coast, where not merely tribes, but even whole linguistic groups have been wiped out. It has been least about the upper lakes and in some portions of the southwest where the Indians retain their original territory and subsist by their accustomed food supply. A few of the large tribes seem to have held their own, if they have not actually increased. Within the present century the eastern Indians generally have been removed to the west of the Mississippi, excepting a few thousand who have emigrated to Canada or crossed the Rio Grande into Mexico. Among those remaining east of the Mississippi are the Penobscots and Passamaquoddies of Maine, the Iroquois or Six Nations of New York, the Pamunkies of Virginia, the Cherokees of North Carolina, the Catawbias of South Carolina, the Seminoles of Florida, the Miamis of Indiana and the Ottawas, Chippewas, Menominis, Pottawatomis and Oneidas of Michigan and Wisconsin, aggregating about 25,000 in number. Nearly all those within the United States are now on reservations assigned to them, excepting a few who have exchanged the reservation system for citizenship.

Language.—The hundreds of tribes north of the Mexican boundary spoke nearly as many languages, and double or treble that number of dialects, but these are all reducible to 57 linguistic stocks, viz.: Algonquian, Athapaskan, Athacapan, Beothukan.

Caddoan, Chimakuan, Chimarikan, Chimmesyan, Chinookan, Chitimachan, Chumashan, Coahuiltecan, Copehan, Costanoan, Eskimauan, Esselenian, Iroquoian, Kalapooian, Karankawan, Keresan, Kiowan, Kitunahan, Koluschan, Kulanapan, Kusan, Lutuamian, Mariposan, Moquelumnan, Muskhogean, Natchesan, Palaihnihan, Piman, Pujunan, Quoratean, Salinan, Salishan, Sastean, Shahaptian, Shoshonean, Siouan, Skittagetan, Takilman, Tanoan, Timuquanan, Tonikan, Tonkawan, Uchean, Waulatpuan, Wakashan, Washoan, Weitspekan, Wishoskan, Yakonan, Yanan, Yuki, Yuman, Zuñian.

To appreciate this great linguistic diversity, due largely to the isolation of small communities in the savage condition, it is only necessary to remember that almost the whole of Europe is held by a single great stock, the Aryan, which extends also across Asia, through America and Persia, into India. Of the native American stocks the Algonquian was greatest in territorial extent and most important in history. Holding nearly the whole Atlantic coast, the Ohio valley, the lake region and the interior of Canada, the Algonquian tribes were the first to greet the French, English and Dutch pioneers and were first called upon to oppose the shock of civilized invasion. While the linguistic material from the majority of stocks named is very scanty, that of a few is voluminous and important, chief among these being the Algonquian, Iroquoian, Muskhogean and Siouan. Several small newspapers are regularly published in native languages in alphabets devised for the purpose, only one of which, however, the Cherokee, is of Indian invention.

Food.—Contrary to common opinion, the majority of the tribes depended chiefly upon agriculture for their subsistence. Hunting was usually a secondary occupation, excepting on the plains, where the equestrian tribes lived almost exclusively upon buffalo meat. It is doubtful, however, if this region had any considerable population before the introduction of the horse in the sixteenth century. Several of the plains' tribes have always been noted for their agriculture, as the Pawnees, Rees and Wichitas, while others have traditions of a time when they lived farther east and planted corn. The tribes east of the Mississippi cultivated corn, beans, pumpkins, tobacco and sunflowers, and understood the principle of manuring. In the northern regions they gathered wild rice and cranberries, and have taught the whites how to extract sugar from the maple. Along the Atlantic coast they made great use of clams and oysters, and set up fish weirs at the mouths of the larger streams. The tribes of the Columbia region were fish, root and berry-eaters. Those of California and the interior basin subsisted chiefly upon acorns and piñons supplemented by jack-rabbits and other small game. The Pueblos of the southwest were entirely agricultural and raised great quantities of corn and beans, keeping always on hand sufficient for a year's necessities. The Hopi have fifteen distinct varieties of native corn, and their women know at least fifty ways of preparing it. All the tribes made use of the larger game when it could be had, but as a rule the buffalo hunters refused to eat fish or birds. Cannibal practices existed in connection with warlike or religious rites, but cannibalism in the ordinary sense of the word was unknown, excepting perhaps within a limited area along the western Gulf coast. Some of the southwestern tribes prepared a mild intoxicant from corn, and those of Texas were given to the use of an exhilarating cactus.

Houses.—Between the Rio Grande and the Arctic coast there were found about thirty well-defined aboriginal house types, each corresponding measurably to a distinctive environment and habit of life. The Eskimo house was a square-built structure of stone, planks or even blocks of snow, usually partly underground and entered by a covered passageway. The typical structure of the eastern tribes of the timber region, from Labrador to Carolina, was the *wigwam*, a round-topped structure of poles, covered with bark or mats woven from rushes, and built to accommodate one or more families. The Iroquois "long-house" was an improvement upon this type, having a shed roof, and being sometimes one hundred feet in length, with partitioned rooms for more than twenty families. In the Gulf States the houses were usually more substantial structures of logs, partially covered with earth, and arranged, where the nature of the ground permitted, around a central plaza. The more important or exposed towns were protected by stockades, and the town-house or council building was frequently elevated upon an artificial mound. There were also granaries, "temples" and sweat lodges, besides the temporary structures erected during hunting trips. About the lakes the bark-covered tent was most commonly used. Throughout the whole extent of the plains the conical skin-covered *tipi* was found best adapted to the necessities of the roving buffalo hunters, although several tribes, as the Mandans and Pawnees, had permanent villages of strongly-built log houses, circular in shape and covered with earth. In the south the Wichitas built a neat grass house upon a framework of poles. The predominating type of the Columbia region was of boards, put together in rectangular form and elaborately painted with mythologic designs, frequently also with a carved and painted totem pole erected in front. Some of these houses were of immense size, one described by Lewis and Clark

having been 30 feet wide and 226 feet in length, and accommodating a whole community under a single roof. The *wikiup* of the Piutes and Apaches was hardly more than an arbor of brushwood merely sufficient to keep off the rays of the sun, but the Navaho *hogan* was solidly built of logs and earth, chinked with cornstalks, while some of the stone-built *pueblos* of the Rio Grande region, with terraced stories and walls two feet or more in thickness, have endured for centuries. Several distinctive types were found in California, one of the most peculiar being that of the Yokuts, consisting of a row of wedge-shaped rush houses, with a continuous awning of brushwood in front. Almost universally the fire-place was in the center of the room, the smoke escaping at the top through a hole without a chimney.

Mortuary Customs.—There was great diversity in regard to the disposal of the dead, according to the natural environment or the special religious idea of the tribe. Probably the most widespread method was by inhumation, either immediate or final. Among some tribes of the South Atlantic region the dead were preserved as mummies in houses especially built for the purpose. Among the Hurons of Ontario the bodies were exposed on scaffolds until the flesh had rotted, when the bones were gathered and deposited in a common pit. The Choctaws buried the corpse until the flesh had decayed, then dug up and cleaned the bones and packed them carefully away in their houses. Some western tribes buried in coffins laid upon the surface of the ground, while others, as the Sioux and Cheyennes, deposited the corpse on scaffolds or in trees. The Piutes and the tribes of the lower Colorado generally practiced cremation, while some of those on the Columbia laid the corpse in a canoe hidden away in the forest. The custom of burying or burning the property of the deceased along with the body was practically universal, and the custom of depositing food at the grave was also very prevalent. Ceremonial wailing and gashing of the body on the death of a relative were common, especially on the plains. There was an almost universal unwillingness to speak the name of a dead person, and in some tribes the surviving relatives changed their own names and even temporarily dropped from their language any word suggestive of the dead name.

Dress and Ornamentation.—The dress varied according to the requirements of the climate and the nature of the material at hand, but in general the Indians wore little clothing excepting in the coldest weather and on ceremonial occasions. The Eskimos of the extreme north were warmly clad in garments of fur with the hair outside, over which they sometimes wore waterproof protectors of seal intestine. Throughout the rest of the territory extending southward to the Rio Grande the prevailing costume was of dressed buckskin and consisted generally of G-string, leggings and moccasins, with a shirt for ceremonial functions and a robe of some heavier material drawn about the shoulders in cold weather. The women wore short shirts, or tunics with open sleeves, supplemented on occasions by leggings and moccasins. In a few tribes they wore only a shirt of prepared bark fiber. In the southwest robes woven from strips of rabbit fur, or from a species of native cotton, were common, and in recent years the woolen blankets and belts of the Navahos and Hopis have achieved a wide reputation. In nearly all tribes the children of both sexes went naked. Paint was used by men, women and children on all dress occasions, the choice of color and design being determined by the nature of the ceremony. Tattooing was common, and was frequently used to designate the tribe of the individual. In some tribes the hair was allowed to grow to its full length, while in others it was cut or shaven in a variety of patterns and decorated with feathers or other ornaments. All the tribes of the plains and the eastern timber country wore the scalp lock, a small braid of hair hanging down behind from the top of the head. With the Mokis the style of head-dress indicated whether or not a woman was married, and probably in all tribes the cutting off of the hair was a sign of mourning. Labrets were used along the Alaskan coast. The eastern Indians and those of the plains bored the ears for pendants, and some even cut around the cartilage until the lobe hung down almost to the shoulder. Beads, bangles, wristlets, rattles and perfume pouches were worn, and usually also some small protecting amulet. Among special costumes for dances and other ceremonies may be noted the magnificent eagle-feather war-bonnets of the plains' warriors and the elaborate masks and head-dresses of the Pueblos. The Navahos now wear fine belts, necklaces and other silver ornaments of their own manufacture.

Industries.—The native arts, while few and simple, were perfectly adapted to the necessities of the tribes, and the handiwork was often wonderfully beautiful in execution. Before the coming of the whites their tools were of stone, bone or shell, the only metal in use north of Mexico being copper, which was found native about Lake Superior and was beaten and stamped into various objects of use or ornament. Since their acquaintance with the whites the Navahos of New Mexico and Arizona have developed considerable proficiency in silver working, melting down silver coins for this purpose. Mica was extensively quarried by the Carolina tribes for mirrors and other ornamental purposes. Every suitable rock was used in the manufacture of arrowheads, knives, scrapers, hammers and pipes. There was a regular system of inter-tribal trade and mica plates from Carolina, shell ornaments from the coast re-

gion, objects wrought from the copper of Lake Superior, and pipes carved from the red catlinite of Minnesota, have been found, in actual use, or deposited in mounds, thousands of miles from their place of origin. Their weapons were the knife, hatchet, club, bow and lance, with the shield and sometimes a sort of breastplate for defense. Tools and weapons of iron quickly superseded the stone implements after the arrival of white men, and the introduction of horses and fire-arms changed the whole character of Indian warfare.

Their house-building and agriculture have been already noted. Their canoes were of wood, bark or skin, and often beautifully carved and painted, those of the Columbia region and Alaskan coast being especially remarkable for size and workmanship. The agricultural tribes had mortars of stone or wood, with the exception of the Pueblos and others of the southwest, who ground their corn upon metates into meal of various degrees of fineness. Among the Pueblos and in nearly all the tribes of the eastern United States the women were expert potters, understanding the art of mixing and tempering the clay, and building up the vessel by the coil process, without the use of a wheel. According to the method of the tribe the exterior of the vessel was smooth and polished, stamped with wooden stamps or textile fabrics pressed into the soft clay, or painted with designs in various colors. Pipes and figurines were also made of clay, as well as of stone, and masks and dolls were carved from wood. The Alaskan coast tribes were especially expert slate carvers, while the Eskimo worked in bone and walrus ivory. The art of basket-making was developed over wide areas, cane and wood splints being used in the east, while maguey fiber and grass were more common in the west. The California basket work is probably the finest and most beautiful in the world. The women were always skin dressers, and in several eastern tribes they wove beautiful mats from rushes or other materials, while the Pueblos had devised a loom upon which they produced fabrics of native cotton. Since the introduction of sheep by the early Spanish missionaries the Navahos have learned the art and developed it into their principal industry. Both vegetable and mineral dyes were in use, and the action of mordants was well understood. The dog is the only animal certainly known to have been domesticated before the introduction of the horse, with the exception of eagles and other birds caged for their feathers among the Pueblos.

Amusements.—War, hunting and home duties occupied but a small share of the Indian's time, and his abundant leisure was spent in a constant round of dancing, feasting and gaming. The dance was usually ceremonial and religious in its chief purpose, and feasting was an accompaniment of every important function. The principal musical instruments were the drum, rattle and eagle-bone whistle. The sedentary tribes had a dance calendar, regulated by the changes of the seasons, but with the roving tribes of the plains almost the only dance having a fixed period was the Sun Dance, celebrated when the cottonwoods bloomed in June. There was a variety of games, some of which were known over a wide extent of territory. The favorite athletic game from Hudson bay to the Gulf was the ball-play, which, under the name of *la crosse* or *raquette*, was adopted by the French colonists. Another was that known as *chûnki* among the Creeks. It was played with a wheel and a stick curved at one end, the object being to roll the wheel and slide the stick after it in such a way that when both fell to the ground, the wheel would rest within the curve of the stick. Dice games were very common, and the favorite amusement around the tipi fire during the long winter evenings were "hunt-the-button" games, in which the hands kept time to the accompaniment of a song. Foot races, often ceremonial in character, were common, especially among the sedentary Indians, while horse-racing is still a leading pastime upon the plains. Betting was a feature of every contest, and the Indian would wager his dearest possession upon the result.

In addition to "hunt-the-button" and some others common to both sexes, the women had also their own special games, among which were shinny, football, certain dice games, and the awl game. In football the ball was kicked with the toe and knee, the object being to keep it in the air as long as possible. The awl game was played with marked sticks, by a number of women seated around a blanket, the tally being kept with an awl stuck in at various points along the margin.

Children's games were largely an imitation of the more serious work of their elders. Boys spun tops, ran races and made bows and arrows, with which to shoot grasshoppers and small game. Girls helped their mothers with the work and learned to sew, weave and do beadwork under their instruction, or played "house" with miniature tipis and buckskin dolls.

Organization.—Most of the native governments were based upon the clan system, under which the members of a tribe were grouped into a number of clans or gentes, persons of the same clan being considered as relations, in effect constituting one large family. The man and his wife must be of different clans, and the children generally belong to that of the mother. Certain duties and privileges were hereditary in particular clans and the clan chiefs had each their appointed place in the tribal councils. This system was general throughout most of the United States and northward, but

seems to have been unknown in some parts of the west. Tribes were sometimes bound together in confederacies, usually loose and temporary in character, but in some instances complex and enduring in structure, as in the case of the celebrated league of the Iroquois. Government was by custom and precept rather than by individual authority, and few chiefs had any control outside of their own village. Among the Iroquois the women were voters in all matters of public concern. The military organization was a definite system, the warrior advancing regularly from the lowest to the highest degree according to his merit and experience. There were also shield societies, medicine societies and dance societies, each having its own secrets, songs and regulations.

Religion.—The Indians were polytheists and for them every tree and rock, every plant and animal, and every great power of nature had its ruling spirit, to be propitiated with prayer and sacrifice. Of abstract morality, except as it concerned tribal custom or property right, there was little idea. Heaven or hell had no place in their theology, the spirit world being simply a shadowy counterpart of this. Despite the popular opinion, they had no supreme "Great Spirit," but prayed to whatever god or demon seemed most competent to the necessity. With some tribes the Sun was the principal deity, with others the Buffalo or Rain god. In every tribe there was a sacred symbolism and figurative ritual understood fully only by the priests. Every man had his individual "medicine" or protecting amulet, and there was frequently also a tribal palladium around which centered the prosperity and even the existence of the nation. Besides the ordinary doctors and conjurers there was usually a regular order of initiates, who guarded the traditions, interpreted the omens and arranged the details of all religious ceremonials.

INDIANS OF THE UNITED STATES, OFFICIAL REPORTS ON. The report of the Commissioner of Indian Affairs for the year ending June 30, 1898, mentions some interesting facts in regard to the present condition of the Indians. The appropriations for the Indian service in the fiscal year 1898 amounted to \$7,431,620 and for the fiscal year ending June 30, 1899, Congress appropriated \$7,653,854, an excess of \$222,234 over the previous year. The principal items of expenditure are first the fulfillment of treaty stipulations, second, the support of schools, and third what are classified as current and contingent expenses.

The Commissioner's report discusses among other topics, the progress of education among the Indians during the year, the selling of liquor to Indians, the granting of allotments and patents, the recent progress of irrigation on the various reservations, the work of several commissions recently appointed to certain Indian tribes and the character and purpose of the Indian exhibit in the Trans-Mississippi International Exhibition at Omaha.

Education.—The growth of the educational department in the Indian office has been remarkable. In 1877 there were 48 boarding schools and 102 day schools with an attendance of 3,598 pupils and only \$20,000 was appropriated for their support. The following table shows the progress that has been made since that date:

YEAR.	BOARDING SCHOOLS.		DAY SCHOOLS.		TOTALS.	
	No.	Average attendance.	No.	Average attendance.	No.	Average attendance.
1877.....	48		102		150	3,598
1878.....	49		119		168	4,168
1879.....	52		107		159	4,448
1880.....	60		109		169	4,851
1881.....	68		106		174	4,976
1882.....	71	3,077	76	1,087	147	4,714
1883.....	80	8,793	88	1,368	168	5,688
1884.....	87	4,723	98	2,287	185	6,980
1885.....	114	6,301	96	1,342	200	8,143
1886.....	115	7,330	99	2,370	214	9,630
1887.....	117	8,080	110	2,500	227	11,230
1888.....	126	8,708	107	2,715	233	11,420
1889.....	136	9,146	103	2,406	239	11,552
1890.....	140	9,865	106	2,367	246	12,232
1891.....	146	11,485	110	2,169	256	13,598
1892.....	149	12,428	128	2,745	277	15,167
1893.....	156	13,635	119	2,686	275	16,305
1894.....	157	14,457	115	2,690	272	17,220
1895.....	157	15,081	125	3,127	282	18,138
1896.....	156	15,683	140	3,379	296	19,375
1897.....	145	15,088	149	3,050	294	18,673
1898.....	148	16,112	147	3,536	295	19,648

From this it will be seen that a uniform and steady increase in attendance has taken place. As to the character and ability of the students the reports of teachers show

that only 24 per cent. of the pupils were considered bad or worthless, while 73 per cent. were reported as good or medium, and 3 per cent. as excellent. The Commissioner's report does not show the ultimate effects of education on the character of the Indian after he has returned to his people, but that during the school period 76 per cent. of the 19,648 Indians in attendance showed a good average of ability and moral character is certainly a significant fact. Of the 295 schools in operation during the year 1898, 242 were under the exclusive control of the Indian Department. The others were contract schools and mission schools. The Department does not control the education among the Five Civilized Tribes or among the Indians of New York. The Indian agents have had to contend with several adverse influences to education among the Indians. The older members of the tribe oppose the sending of the children to schools. This opposition has led the government to empower agents and superintendents to arrest any person or persons who should hinder the return of Indian children who had left school or who should prevent the placing of the children in the schools of the reservations. By means of this power the agents have been able to improve both the enrollment and the attendance. The prejudice of the older Indians to education seems invincible, and it is only by a resort to actual coercion that the benefits of education are secured to the children. The Indian boarding schools during the year ending June 30, 1898, had an average attendance of 5,347, and an enrollment of 6,175. To these schools, which are usually situated near centres of population, are sent the more advanced pupils from the schools and reservations. In them the attempt is made to train the pupils in industrial work. In some of the schools, farming, stock raising, dairying, etc., are carried on, and in others excellent work is done in the making of harness, shoes, wagons, etc. The girls are taught cookery, sewing and other domestic arts.

Seventy-five boarding schools were situated on the reservations and in these industrial and agricultural training is also given. Even in the day school a great stress is laid on the manual training of the pupils. Since 1890 some of the Indian children have been placed in the public schools, but the Commissioner reports that this plan has not met with much success, and that in 1898 there was a decrease of 100 such pupils as compared with the previous year. The contract school system has played a less important part in the education of the Indians during the last few years than formerly. The appropriation of funds for the education of Indians in schools under private control has decreased from \$611,570 in 1892 to \$212,954 in 1898 and the appropriation for 1899 was \$172,462.

Some years ago the buildings for Indian education were found to be very defective in sanitary condition and in convenience. There has lately, however, been a great improvement in this respect. Care has been taken to secure good sanitation and water supply, and many new buildings have been erected. Among the recent improvements in the school plant may be mentioned the new buildings at White Earth and Vermillion Lake, Minn.; Cherokee, N. C.; Flandreau, S. D.; Mt. Pleasant, Mich.; Greenville, Cal.; Arapaho, Okla.; Phoenix, Ariz.; Toledo, Ia.; Rapid City, S. D., the Cheyenne and the Arapaho reservations, and the Navajo reservation. The work of supervision and inspection has been facilitated by the establishment of two additional school supervisors' positions. The value of the educational plant owned by the government is estimated at \$3,000,000, and the annual appropriations for the schools in 1898 and 1899 were respectively \$2,631,771 and \$2,638,390.

Indian Exhibitions.—Besides the Indian Congress at Omaha (q. v.) the government granted authority during the fiscal year to Morton County Fair Association for an Indian exhibition at Mandan, N. D., to Messrs. Cody (Buffalo Bill) and Salisbury, for a general Indian show during the season of 1898, and to the Secretary of the Milwaukee Carnival Association for an exhibition of a representative Indian village on the lake shore at Milwaukee, Wis., in the summer of 1898.

Sale of Liquor to Indians.—The government officers had as usual much difficulty in preventing the sale of liquor to the Indians in 1898. At Round valley, Cal., the condition of affairs was exceptionally bad. The agent found that liquor had been introduced into the country in considerable quantities. Seven persons were arrested for taking part in the traffic and five of these were convicted and sentenced. In the Nez Percé Agency there were also several arrests of persons charged with the sale of liquor to the Indians and at Ardmore in the Chickasaw nations in Indian Territory, it was found that a number of saloons were running in open violation of the law. At Wynnwood it was found that the only person with authority to suppress the liquor trade among the Chickasaws was an Indian policeman, who, when found, was himself in such a state of intoxication as to be unable to walk. Complaints were also made of the sale of liquors to the Florida Seminoles and attempts were made to suppress the traffic.

Allotments and Patents.—A good many patents were issued and delivered during the fiscal year. The Yakimas received the greatest number, namely 1,713, and among the other tribes to which patents were issued were the Sioux, the Mission Indians of California, the Omahas of Nebraska, the Sacs and Foxes, the Winnebagoes, and the

Chippewas. Considerable difficulty was presented on account of the opposition of some of the older chiefs to the holding of land in severalty. Some applications were received for home lands. A good many of the Winnebagoes of Wisconsin have made entries under the Homestead Act.

Commission to the Five Civilized Tribes.—On October 11, 1897, this Commission reported on the work required of them by the act of June 10, 1896, namely "To hear and determine the application of all persons who may apply to them for citizenship in any of the said "nations," and after said hearing they shall determine the right of such applicant to be admitted and enrolled." By far the greatest number of the applications were rejected by the Commission and those admitted numbered 2,075. On June 28, 1898, the so-called Curtis Act received the approval of the President. This is regarded as one of the most important pieces of legislation respecting Indian affairs that has been adopted during the past ten years. Its general purpose is to transfer the control of property rights in the civilized nations from tribal authority to that of the United States, in the same way as their political government had been transferred by the act which was to take effect January 1, 1898. It is of course a part of the general plan to reorganize Indian Territory and assimilate it politically and legally to the rest of the United States. In place of the present exclusive holding and use of lands by a few individuals under the existing tribal government, the Curtis Bill is designed to substitute a new code of United States law for the Territory. Instead of communal holdings it seeks to create individual holdings under United States control. Considerable opposition was offered by the Indians to this change and delegations were sent to Washington for the purpose of preventing legislation. The Curtis Act imposed additional duties on the Commission to the Five Civilized Tribes. For instance, they were required to allot the lands of the Five Tribes; and the enrollment of each tribe which the Commission had been already required to make was rendered by this act conclusive as to the tribal membership. One section of the Curtis act provides that "No person shall be enrolled who has not heretofore removed to and in good faith settled in the nation in which he claims citizenship." The following quotation from the report of the Commission summarizes its work during the fiscal year ending June 30, 1898:

"Since the last report the Indian laws in force in the Territory and the Indian courts in which they were administered have given place (with a few unimportant exceptions) to laws corresponding to the laws of the State of Arkansas affecting the same subject-matter, and have been made applicable to all persons in the Territory, without distinction of race. These laws are to be administered in United States courts and enforced through United States officers. Every Indian resident claiming to be a citizen can try his title in these courts, and obtain a final decision, if he desire it, in the United States Supreme Court, like any other citizen of the Republic. These courts are now open to every Indian citizen to secure, as against the tribe or anyone claiming under it, the equal use with all other such citizens of the common property of the tribe, or, if he choose, he can have his equal part set off to him by partition for his own exclusive enjoyment. All laws hereafter enacted in the legislative councils of these tribes are to be, before taking effect, submitted to the President of the United States for his approval or disapproval, and all the moneys of these tribes are to be paid to and disbursed by United States officers. The royalties from their coal mines and rentals from their grazing lands are no longer to be paid to individuals, but into the Treasury of the United States, for the equal benefit of every member of the tribe. Provision has also been made during the year for the allotment of all the tribal lands of the Territory equally among all its citizens. And this has been attained as to nearly all of them upon terms to which the tribes themselves have by popular vote agreed. If the agreement with the Creeks be ratified, as is expected, this will be true of all except the Cherokees, and as to them it has been provided by statute. It has been also provided by these agreements and this statute that the white residents in the towns in the Territory, now numbering many thousands, unable heretofore to obtain title to the land upon which they have built their homes and expensive business houses in flourishing towns, can now purchase, at a fair appraisal, the land upon which they have built and on which they have expended large sums in expensive business outlays. In short, whatever rights, civil or political, are enjoyed by the citizen resident in any of the Territories of the United States, the same rights are now secured to the citizen Indian, and largely to the white resident also, in the Indian Territory." See also INDIAN TERRITORY and PILLAGER OUTBREAK.

INDO-CHINA is the collective name of the French dependencies in the Indo-Chinese peninsula, namely, Anam, Cambodia, Cochin-China, and Tonquin (qq. v.). There is a Superior Council for Indo-China which decides upon the budget of Cochin-China and gives advice in respect to the budgets of Anam, Cambodia, and Tonquin. The Governor-General (M. Doumer in 1898) has his residence at the city of Hanoi. The United States Consular Report published in October, 1898, gives the trade between France and Indo-China as \$8,200,000, of which \$3,400,000 were imports into France and \$4,800,000 were exports from France. The principal imports into

France were rice, pepper, raw hides, exotic resins, cocoa or copra almonds, volatile oil or essences, and albumen, the most important by far being rice, which was valued at \$2,409,847. The exports from France included tissues, passementerie, and cotton ribbons, which were the principal items, and wine, tools, and other metal manufactures, woolen goods, toys, fans, and other manufactured articles. According to a convention with China signed on June 25, 1895, which settled the boundary question between French, Indo-China, and the Chinese territory, France acquired the right to extend the Anamite railway into China, thus securing access to the latter country by way of Tonquin and Yunnan. (See CHINA.) This seeming infringement on British rights, since the Shan States were under British administration, led to a further agreement between England and France in 1896 by which the Mekong river separated the possessions of the two nations. See SIAM.

INDY, VINCENT D', composer, born in Paris, in 1851. He is a pupil of César Franck and of the Paris Conservatory. His works reflect the Wagnerian influence and are constantly gaining in popularity on both continents. They include the *Wallenstein Symphony*; Overture to *Antony and Cleopatra*; *La Forêt Enchantée*, ballads from Uhland; *La Chevanchée du Cid*, score for baritone, chorus, and orchestra; *Songe fleurie*, orchestral legend; chamber music; waltzes; and an opera entitled *Fervaal*. See MUSIC.

INFUSORIAL PIGMENTS. F. Kutscher has isolated from *Euglena sanguinea*, one of the flagellate infusoria, common in some drinking waters, a deep brown-red pigment, which is soluble in alcohol and can be obtained from the alcoholic solution in the form of octahedral crystals; they melt at 105°, and are colored blue by 50 per cent. sulphuric acid, and green by 50 per cent. nitric acid. An ethereal solution gives one absorption band in the green region of the spectrum. This pigment is not the same as the purple pigment derived from many bacteria which gives three absorption bands.

INSTITUT DE FRANCE is composed of five academies—Académie Française, Académie des Inscriptions et Belles Lettres, Académie des Beaux-arts, Académie des Sciences, and Académie des Sciences Morales et Politiques (qq. v.).

INSTITUTE OF ARCHITECTS, AMERICAN, founded in 1857, has 25 chapters, 461 fellows, and 55 honorary members. President, Henry Van Brunt, St. Louis; Secretary and Treasurer, Glenn Brown, Washington, D. C.

INSTITUTE OF ELECTRICAL ENGINEERS, AMERICAN, has its executive library and reading-room at offices, 26 Cortland street, New York. Arthur E. Kennelly, President; Ralph W. Pope, Secretary. Membership, 1,100. It holds meetings, and prints its transactions monthly, at 12 West 31st street.

INSTITUTE OF HOMEOPATHY, AMERICAN, organized 1844. Delegates are appointed from permanently organized State societies, from country and district societies that are recognized by their respective State societies, from established hospitals, asylums for the insane, dispensaries and medical journals, and from each medical college associated with the Institute. Next annual meeting will be held at Atlantic City, N. J., in June 1899. President, B. F. Bailey, M. D.; Secretary, E. H. Porter, M. D., 181 W. 73rd street, New York City.

INSTITUTE OF MINING ENGINEERS, AMERICAN, organized in 1871, has now 2,600 members. President, Charles Kirchoff, New York; Secretary, R. W. Raymond, 13 Burling Slip, New York.

INTERFERENCE. See PHYSICS (paragraph Interferential Spectrometer).

INTERMITTENT FILTRATION. See SEWAGE PURIFICATION.

INTERNATIONAL BROTHERHOOD LEAGUE. See UNIVERSAL BROTHERHOOD.

INTERNATIONAL CONGRESS OF ZOOLOGISTS. See ZOOLOGICAL SOCIETIES.

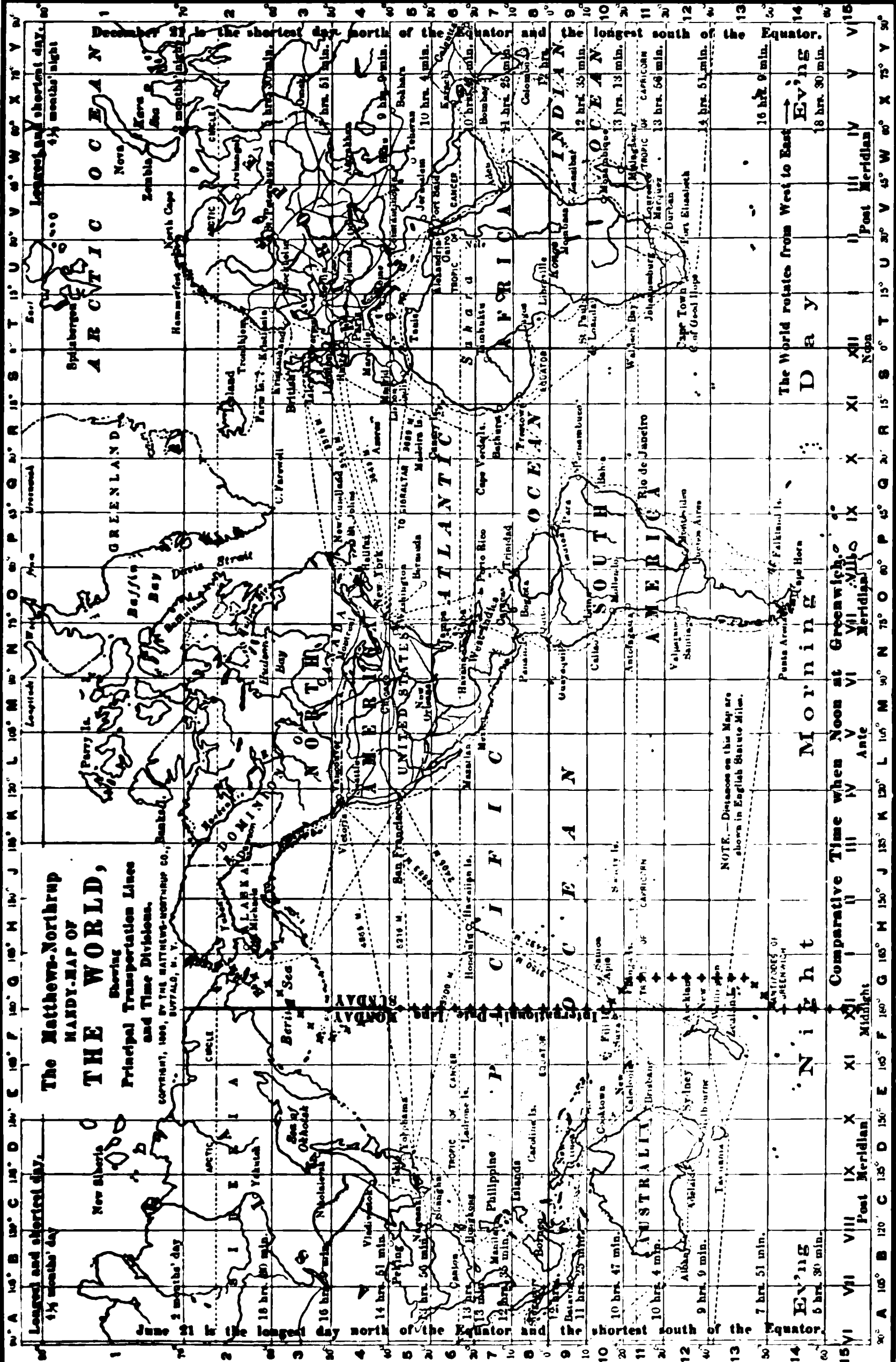
INTERNATIONAL DATE-LINE. The acquisition of the Philippine Islands by the United States has brought the subject of the International Date-Line into especial prominence, so that it has received much attention in the newspapers and elsewhere. We have therefore thought it of interest to give a brief explanation of this line and its uses. Before doing so, however, it will be desirable to remind the reader of the cause that brings about differences of local time in different places on the earth, since this question of time differences is very intimately connected with the subject of the date-line. Every traveller knows that if his watch is right when he starts out on a journey, and even though it runs quite correctly, it will need to be re-set when he arrives at his destination. For the local time at the place to which he may have gone is never the same as it was in the place from which he started. It is quite easy to understand how these time differences come about. If we disregard certain small irregularities in the sun's apparent motion, a clock correctly set to local time in any place will indicate noon at the instant when the sun is on the

meridian. That is to say, the sun rises in the morning in the east, gradually climbs up in the sky, and is at its highest (or *meridian*) altitude at noon. Let us now consider two neighboring places on the earth, quite close together, and one of them just east of the other. Then it is evident that as the sun travels from east to west, when it is at its greatest altitude directly over the western place, it will already have passed over the eastern one. In other words, when it is noon in the western place it is already after noon in the eastern one. We have, therefore, this simple rule; if we consider two places separated in an east-and-west direction, there will be a difference of time, and the eastern place will have the later time.

The amount of this time difference can be computed quite readily, since it depends upon the distance in an east-and-west direction between the two places. But this will correspond to the difference in longitude. It will be remembered that longitudes are measured by imagining a series of great circles, called longitude meridians, drawn upon the earth's surface, and passing directly from the north pole to the south pole. If we wish to know the difference of longitude between two places, we must imagine two such circles drawn through those places, and then the longitude difference will be simply the angle at the north pole between the two circles. It is usual to select some one place on the earth as the origin or standard for the measurement of longitudes. We then define as the longitude of any other place the difference of longitude as just explained between the origin or standard place and the place in question. By the common consent of most civilized nations, Greenwich, England, is adopted as the origin of longitudes. It is shown in works on geography and astronomy that we can compute the time difference of any two places, as soon as we know their longitude difference. The rule for doing so is quite simple. Divide the difference of longitude in degrees by the number 15, and the quotient will be the time difference in hours and fractions of an hour.

Having thus explained the cause of time differences, we must now give a brief account of what is known as *standard time*. A great deal of confusion and inconvenience has been caused by the circumstance that the times of various places differ by odd or fractional amounts. Thus the difference between New York and Chicago is 54m. 33.1s.; and so with most other places. This results in making it necessary to make calculations with intricate and inconvenient numbers, even for ordinary business purposes. Especially puzzling has been the matter of railroad time. For the various railroad companies usually decided to use over entire sections of their territory the local times of the principal cities through which they passed. Thus it happened that some small town, where two or more great railroads met, might have two or more different railroad times. The resulting confusion in some cases finally became quite intolerable. At last it occurred to someone that it was by no means necessary anywhere to use the true local time. It would be sufficient for all business purposes to employ time approximately equal to the true local time. This principle once recognized, it became easy to arrive at an admirable and very practicable system. It was decided to use a standard time based on the longitude of Greenwich and to employ everywhere the local times belonging to the meridians whose longitudes are 15° , 30° , 45° , etc., from Greenwich, and whose times therefore differ from Greenwich by exactly one hour, two hours, three hours, etc. Every place then simply uses the local time of that one of these meridians to which it is nearest, and time differences are always reduced to an even number of hours. The system has now been extended so as to include very nearly all civilized countries.

We come now to the explanation of the International Date-Line. It is evident that since the earth is round, the longitude of any place can be counted from Greenwich either eastward or westward. Thus the meridian 1° west of Greenwich is also 359° east. No confusion results from this so long as we do not go too far from Greenwich. But when we consider places quite on the other side of the earth, it may happen that their longitudes will not be much larger one way than the other. An arbitrary line has therefore been drawn on the map of the world, and by common consent places on one side of this line count their longitudes one way from Greenwich, and places on the other side count it the other way. The accompanying chart shows this line very clearly, and will enable the reader to discover at a glance whether any given place is in west or east longitude. The most peculiar and interesting thing about this date-line is that the date changes in crossing it. A place just east of the line is about 180° west of Greenwich, and its time is therefore about twelve hours earlier than Greenwich. But a place just west of the line is about 180° east of Greenwich, and its time therefore twelve hours later than Greenwich. Thus by conventional agreement these two places differ about 24 hours in time, though they may be very near each other on the earth. And a time difference of 24 hours involves of course a difference in the date and the day of the week. A good example of this is seen in the Fiji Islands and Samoa, Sunday in the latter corresponding to Monday in the former. Vessels crossing the line are obliged to drop a day or count one twice, according as they are going west or east. But as the neces-



Theoretically the change of date should be along the 180 meridian of longitude. For practical purposes the International Date Line has been generally adopted as marked on the map, thus: + + + + +

sities of navigation are approximate, the usual custom on shipboard is to pay no attention to the conventional line, but to change the date when crossing the 180° meridian of longitude.

An application of the above principles to the Philippine islands gives the following results. The longitude of Manila is 121° east of Greenwich, and therefore the local time there is 8h. 4m. later than at Greenwich. But the standard time at New York is 5h. earlier than at Greenwich, so that Manila local time is 13h. 4m. later than New York standard time. The standard time at San Francisco being 3h. earlier than at New York, Manila is 16h. 4m. later than San Francisco. Thus Saturday noon at San Francisco corresponds to about 4 A. M. Sunday morning at Manila.

INTERNATIONAL LEAGUE OF PRESS CLUBS, organized in 1891, has 3,000 members. President, P. C. Boyle; Secretary, C. Frank Reed, Boston Press Club.

INTERNATIONAL SEA FISHERIES CONGRESS. See FISHERIES.

INTERNATIONAL SOCIETY OF SCULPTURE, ETC. See SCULPTURE (paragraph Exhibitions).

IOWA. A western State of the United States with an area of 56,025 square miles. Capital, Des Moines.

Mineralogy.—Iowa continues to hold first place as a coal producer among the States west of the Mississippi, and in 1897 had the largest output in its history excepting in 1888, the production being 4,611,865 short tons, spot value \$5,219,503—an increase in output in a year of 657,837 short tons. The clay industry was second in value, \$1,821,247, principally in the manufacture of brick and tile.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 254,999,850 bushels, value \$58,649,966; wheat, 22,189,624, \$11,538,604; oats, 123,428,126, \$29,622,750; barley, 9,133,020, \$3,105,227; rye, 1,177,126, \$470,850; buckwheat, 212,720, \$102,106; potatoes, 16,369,360, \$4,910,808; and hay, 7,908,159 tons, \$32,028,044—total value, \$140,428,355. The State ranked first in the production of corn, oats, and hay; second in potatoes; and third in barley. Livestock comprised, horses, 981,352; mules, 31,547; milch cows, 1,250,775; other cattle, 2,163,584; sheep, 613,343; and swine, 3,408,281—total head, 8,448,882. The State ranked first in the number of swine, second in both milch cows and other cattle, and third in horses.

Commerce.—During the fiscal year ending June 30, 1898, the imports of merchandise at the ports of Council Bluffs, Des Moines, Dubuque, and Sioux City, aggregated in value \$55,378—a decrease of \$34,843 in a year; exports, nothing.

Transportation.—In 1897 the State Railroad Commissioners reported the total length of railroads in the State at 8,495 miles; valuation, \$44,494,431; earnings of all roads under State charter, \$41,841,292. The equalized assessed valuation in 1898 was \$44,606,000, the highest since 1894.

Banks.—On October 31, 1898, there were 169 national banks in operation and 75 in liquidation. The active capital aggregated \$13,110,000; circulation, \$4,904,751; deposits, \$38,829,462; reserve, \$12,011,585. There were also 209 State banks with capital \$9,260,700; deposits, \$22,701,397; resources, \$34,040,385; surplus and undivided profits, \$1,965,353; 124 private banks, with capital, \$3,728,141; deposits, \$7,603,263; resources, \$17,548,227; and 172 stock savings banks, with capital, \$7,186,300; deposits, \$36,635,063; resources, \$45,657,260. The exchanges at the United States clearing houses at Des Moines and Sioux City in the year ending September 30, 1898, aggregated \$101,167,902, an increase in a year of \$23,687,706.

Education.—At the end of the school year 1896-7 there were 727,694 persons of school age, of whom 546,836 were enrolled in the public schools and 347,620 were in daily attendance. There were 13,744 school-houses; 28,032 teachers; public school property valued at \$16,355,842, and expenditures \$7,890,430, including \$5,264,354 for teachers' salaries. The public high schools numbered 325, with 1,006 teachers and 24,626 pupils; private secondary schools 45, with 188 teachers and 2,911 pupils; public normal schools 6, with 53 teachers and 1,751 students; private normal schools 18, with 86 teachers and 2,626 students; and colleges and universities 23, with 336 professors and instructors, 5,085 students, and \$390,599 income. Professional schools comprised one of technology, 4 of theology, 2 of law, and 6 of medicine. The State Agricultural College at Ames, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 1,053 periodicals, of which 67 were dailies, 863 weeklies, and 71 monthlies.

Finances.—In 1898 the equalized assessed valuations were: Real estate, \$411,723,421; personal property, \$88,084,509; railroad property, \$44,606,000—total, \$544,247,782, a decrease in a year of about \$10,000,000. On December 31, 1898, the total warrants outstanding amounted to \$400,012.71; cash on hand, \$181,798.48; net deficit, \$218,214.23; war expenses paid, included in the above, to be refunded to the State, \$139,703.74; net deficit after deducting war expenses, \$78,510.49.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 2,190,000. Local estimates gave Council Bluffs, 25,000; Davenport, 35,000; Des Moines, 75,000; Dubuque, 45,000; and Sioux City, 33,500.

Legal Decisions.—Three important legal decisions were rendered in 1898. The United States Supreme Court decided that the State law forbidding the sale of liquors in the State and making it a crime to transport them, was unconstitutional as interfering with interstate commerce. The District Court at Council Bluffs decided that the State law taxing collateral inheritance was unconstitutional on the grounds that it took property without due process of law and therein violated the fourteenth amendment to the Federal Constitution, and also because it contained no provision for annuities. The law had been in effect less than four months. The District Court at Omaha, Neb., declared illegal all marriages of persons, who after obtaining divorces in Nebraska, crossed over into Iowa and there were married to more agreeable mates before the expiration of the six months provided by the Nebraska statutes.

Legislation.—Governor Leslie M. Shaw was inaugurated on January 13. In his inaugural address he congratulated the State on having learned the necessity of a single standard and the supreme necessity of making that gold. The most interesting laws of 1898 are those concerning nursery stock. An act was passed to prohibit the bringing into the State of any nursery stock infested with the "San José scale," providing penalties for violating the law, and to prevent the "scale" from spreading within the State. The State Entomologist must enforce the provisions of the act and when he and his assistants have reasonable grounds of belief that the "scale" exists, they are empowered to examine any nursery, fruit farm, or other place where trees or plants are grown, and if found free from scale, issue a certificate to that effect. It is unlawful to sell or have for transportation any nursery stock outside the county where such nursery stock is grown unless accompanied by this certificate. When requested, or on reasonable grounds of belief in the existence of the "scale," the State Entomologist may, by himself, or by assistants, enter upon such premises and establish quarantine regulations; and if, in his judgment the "scale" may be eradicated by treatment he may order such treatment. If the trees cannot be treated he may order them to be burned and is empowered to enforce such order at the owner's expense if not destroyed by said owner in sixty days. It is unlawful for any person, firm, or corporation to bring into the State any trees, plants, vine, cutting, or buds, commonly known as nursery stock, unless accompanied by a certificate of inspection by the State Entomologist of the State from which the shipment was made, showing inspection and freedom from the "scale;" and it is made a misdemeanor to violate any of the provisions of the act, with a penalty of not less than \$10 and not more than \$100 for each offence.

On April 1, both houses of the legislature passed a bill appropriating \$500,000 to be used in case of war. Iowa illustrated in 1898 the tendency toward State control over public charities and corrections by establishing a board of control having exclusive authority over all State penal and charitable institutions, and the right to inspect educational institutions.

An act was also passed for licensing the practice of "osteopathy" and providing a standard of culture in the branches of anatomy, physiology, chemistry, histology, pathology, gynæcology, obstetrics, and the history and practice of "osteopathy," the study to comprise at least twenty months, or four terms of five months each; a certificate shall not entitle the holder to prescribe or use drugs in his practice, nor perform major or operative surgery. A final clause of the act declares that the system, method, or science of treating diseases of the human body, commonly known as "osteopathy," is not a practice of medicine, surgery, or obstetrics.

National Representatives and State Officers.—The delegates from Iowa to the House of Representatives are: Thomas Hedge from Burlington, Joe R. Lane from Davenport, David B. Henderson from Dubuque, Gilbert N. Haugen from Northwood, Robert G. Cousins from Tipton, John F. Lacey from Oskaloosa, J. A. T. Hull from Des Moines, William P. Hepburn from Clarinda, Smith McPherson from Red Oak, J. P. Dolliver from Fort Dodge, and Lot Thomas from Storm Lake. All are Republicans. The Senators are: John H. Gear (Rep.), from Burlington, and William B. Allison (Rep.), from Dubuque. Officials: Leslie M. Shaw, Governor; J. C. Milliman, Lieutenant-Governor; R. C. Barrett, Superintendent of Public Instruction; George L. Dobson, Secretary; John Herriott, Treasurer; F. F. Merriam, Auditor; Milton Bemley, Attorney-General; and M. H. Byers, Adjutant-General. All are Republicans. Chief Justice, G. S. Robinson; Associates, Scott M. Ladd, C. T. Granger, Josiah Given, C. M. Waterman, and H. E. Deemer; Clerk, C. T. Jones. All are Republicans. In the State legislature there are 100 Republicans and 50 Democrats.

IRELAND, an island forming part of the United Kingdom of Great Britain, has an area of 32,583 square miles, and a population in 1891 of 4,704,750, divided among the four provinces according to the following table:

Provinces.	1891.
Leinster	1,187,760
Munster	1,172,402
Ulster	1,619,814
Connaught	724,774
Total of Ireland.....	4,704,750

In the middle of the year 1898 the population of Ireland was estimated at 4,541,903.

Emigration.—The statistics of emigration have shown a decrease in that movement and at the same time on account of the great improvement in the means of travel an increasing number of emigrants return to Ireland. In 1896 about half of the emigration from England and Scotland was to the United States, while 97 per cent. of that from Ireland was to this country. In 1852 the number of emigrants from Ireland was 190,000, while in 1897 it was only 33,000, and of these according to the United States Consular Report published in June 1898, about half were returning emigrants who had gone to Ireland as visitors from the United States. Of these 33,000 emigrants about 23,000 sailed from Queenstown and over 18,000 were landed at New York. The same Consular Report declares that of the Irish emigrants landed at New York in 1895 less than 5 per cent. were unable to read and write. According to the annual report of the Commissioner General of Emigration in the United States the number of Irish immigrants to the United States in the year ending June 30, 1898, was 25,128, of whom 1,032 could neither read nor write.

Government.—The executive government of Ireland is vested in a Viceroy, or Lord-Lieutenant, who is assisted by the Chief Secretary, the Lord Chancellor of Ireland, the Attorney-General for Ireland, and a privy council. Irish affairs are under the general direction of the ministry in London. The Chief Secretary to the Lord-Lieutenant, or as he is better known, the Chief Secretary for Ireland, is responsible to the House of Commons for his administrative acts, and is assisted by a permanent under-secretary. Ireland is represented in the House of Lords by 28 peers and in the House of Commons by 103 members. The latter were distributed among political parties in November 1898, as follows: 70 Irish Nationalists, 17 Conservatives, 11 Parnellites, 4 Liberal Unionists, and one Liberal. In 1898 the Lord-Lieutenant was Earl Cadogan; the Chief Secretary, Mr. Gerald Wm. Balfour; Under-Secretary, Sir David Harrel; Lord Chancellor, Lord Ashbourne; Attorney-General, John Atkinson, Q. C.

Religion.—The great majority of the inhabitants of Ireland are Roman Catholics, whose number is estimated at about 3,550,000. The country is divided into four ecclesiastical provinces, which are subdivided into 27 dioceses. The number of priests, according to the latest available statistics in 1898, was 3,450, and the number of churches 2,434. The Irish Episcopal Church has made progress in spite of the loss of revenue resulting from the act of disestablishment in 1869. In 1898 the population in attendance at the Episcopal churches was estimated at 600,703. There were 13 bishops, 1,200 incumbents, and 360 curates. In 1898 the Presbyterian Church included 106,602 communicants, with 656 ministers and 590 churches.

Education.—At the head of the educational system in Ireland are the University of Dublin and the Queen's colleges of Belfast, Cork, and Galway. The Catholic University founded in 1854, includes the University of Dublin and seven Catholic colleges. The primary schools of Ireland, which are mostly under the management of the "Commissioners of National Education," numbered at the beginning of the year 1898, 9,057, with 816,000 pupils on the rolls and 521,141 in average attendance.

Statistics of production and trade for Ireland are included in those for the United Kingdom. See the article GREAT BRITAIN.

HISTORY.

Some of the important political events of the year 1898 are more properly discussed in the article GREAT BRITAIN, but a few of the topics of especial local importance will be briefly stated here.

Economic Distress.—Early in the session of the British Parliament the attention of the government was drawn to the destitution of large bodies of the Irish population. The Irish political leader, Mr. Davitt, moved an amendment to the Address, declaring that a great number of the Irish people were on the point of actual famine and that the temporary relief measures proposed by the government had been too long deferred and were wholly inadequate. He said that immediate and generous measures of relief must be adopted and that legislation should be introduced to avert the recurrence of famines in certain districts. Mr. Gerald Balfour, the Chief Secretary for Ireland, admitted the gravity of the situation, but said that the government had already done much to relieve the distressed districts. The amendment was re-

jected and a further motion reflecting on the relief measures adopted by the government was lost. The attitude of the Chief Secretary toward these complaints was that the distress was nowhere so acute as was represented, and that the government had shown itself as sympathetic as the occasion demanded.

Catholic University Education.—Another amendment moved to the Address was that of Mr. Dillon on February 1, 1898, requiring the government to take legislative steps toward the placing of Roman Catholics on an equal footing with Protestants in the matter of university education. Some strong arguments for this were brought out in the ensuing debate. It was declared that the Roman Catholics did not ask for an endowment of their religion. The principle was supported by Mr. Balfour and Mr. Morley, but was actively opposed by some members on the ground that the non-conformists did not desire a Roman Catholic University in Ireland. The amendment was lost.

Question of Home Rule.—Another indication of the activity of the Irish party after the reading of the address was Mr. Redmond's (Parnellite) proposed amendment demanding national government for the Irish people through the establishment of an independent parliament. This proposal was declared by Sir William Harcourt to be in violation of the principle of imperial parliamentary supremacy as embodied in the Home Rule bills of 1886 and 1893, and the Nationalistic leader, Mr. Dillon, refused to support the amendment on account of the ambiguity of the word "independent" and his determination to adhere to the principle of Mr. Gladstone's Home Rule bills. The measure was lost by a vote of 233 to 265, the minority including Parnellites, Nationalists, and 3 Radicals.

Irish Land Commission.—This body, which was appointed on July 12, 1897, to inquire into a report upon the methods of the land commission and the civil bill courts in Ireland under the land acts, reported in 1898 that the jurisdiction of the civil bill courts under the land act should be abolished, and that the persons appointed to determine the valuation of land should be permanent officers. The commissioners also laid down certain rules in regard to the valuation of land and the definition of "fair rent."

For an account of the financial relations with Great Britain, the Irish local government act, and other topics of common interest to Great Britain and Ireland, see the article GREAT BRITAIN.

IRISH CATHOLIC BENEVOLENT UNION, a fraternal society founded in 1869, has 156 subordinate societies and 14,627 members. Since its organization it has disbursed \$2,600,000 and \$69,672 in its last fiscal year. President, Daniel Duffy, St. Clair, Pa.; Secretary, A. A. Boyle, Philadelphia, Pa.

IRISH HISTORICAL SOCIETY, AMERICAN, organized in Boston in 1897 to study the Irish question as relating to America, consists of 1,100 members. President-General, Edward A. Mosely, Washington, D. C.; Secretary, Thomas H. Murray, 34 Newberry street, Boston. There are State Vice-Presidents and an executive council.

IRISH NATIONAL FEDERATION OF AMERICA, founded to aid the Home Rule movement in Ireland by means of parliamentary agitation. Headquarters 47 W. Forty-second street, New York; President, Dr. Thomas A. Emmet; Secretary, Joseph P. Ryan.

IRON AND STEEL. The production of iron ore in the U. S. in 1898 was 21,388,136 tons, but the consumption was nearly one million tons greater. The two important iron-producing regions of the United States are those of Lake Superior and Alabama, the former having produced about two-thirds and the latter nearly one-third of the amount stated above. In the Lake Superior region, the Mesabi district alone yielded 4½ million tons. The production of pig iron in the United States in 1898 was the largest ever known, amounting to 11,712,903 long tons, which is an increase of 22 per cent. over the output for 1897. 75 per cent. of the pig iron was made from Lake Superior ore, and 16½ per cent. from Southern ores. The increased activity in the iron and steel industry, was not only to supply home consumption, but also foreign demand. No new sources of supply have been discovered, except in Alabama, where a large limonite deposit has been opened up near Leeds, and is to be used for making pig iron by the basic process at Ensley. The extent of the iron and steel industry in the United States is well shown by the following figures from the recently issued directory of the American Iron and Steel Association. There are at present 420 active furnaces in the United States, whose total annual capacity is about 19,000,000 tons. In the last two years there has been an increase not only in the capacity of the blast furnaces but also of the rolling mills and steel works, so that there are now 504 of these plants complete. There are 45 Bessemer plants in operation at present, with 100 converters, and the annual converting capacity of them is 10,663,000 gross tons. Of the 99 open hearth steel plants in this country, 43 are preparing to make basic steel, which is becoming of great importance in the United

States. According to the report of the American Iron and Steel Association, the production of pig-iron in 1898 was 11,773,934 tons, which was an increase of 22 per cent. over the preceding year. The following tables indicate the amount of each kind produced, and also the production according to districts:

	1896.		1897.		1898.	
	Tons.	Per Cent.	Tons.	Per Cent.	Tons.	Per Cent.
Foundry and forge iron.....	3,499,899	40.6	3,127,010	32.4	3,437,337	29.2
Bessemer pig iron.....	4,654,955	54.0	5,795,584	60.0	7,337,384	52.3
Basic pig iron.....	336,403	3.9	556,391	5.8	785,444	6.7
Spiegel and ferro.....	131,940	1.5	173,695	1.8	213,769	1.8
Total	8,623,127	100.0	9,652,680	100.0	11,773,934	100.0

The output by districts was:

	1897.		1898.	
	Tons.	Per Cent.	Tons.	Per Cent.
New Eng., N. Y. & N. J.....	350,620	3.6	338,689	2.9
Maryland	193,702	2.0	190,974	1.6
Pennsylvania	4,631,634	48.0	5,537,832	47.0
Ohio	1,372,889	14.2	1,986,358	16.9
Illinois	1,117,239	11.6	1,365,898	11.6
Wis. & Mich.....	236,487	2.4	320,421	2.7
Southern States.....	1,713,469	17.8	1,887,574	16.0
West of the Mississippi.....	36,640	.4	146,188	1.3
Total.....	9,652,680	100.0	11,773,934	100.0

Exports and Imports.—The following table shows the remarkable progress that has been made in the exportation of iron and steel manufactures from the United States since 1880:

Year ending June 30—	Imports.	Domestic Exports.
1880	\$71,266,699	\$14,716,524
1881	60,604,477	16,608,767
1882	67,976,897	20,748,206
1883	58,495,246	22,826,528
1884	40,147,053	21,909,881
1885	33,610,093	16,592,155
1886	37,534,078	15,745,569
1887	49,203,164	15,958,502
1888	48,992,757	17,763,034
1889	42,377,793	21,156,077
1890	41,679,501	25,532,208
1891	53,544,372	28,909,614
1892	28,928,103	28,800,930
1893	34,937,974	30,106,482
1894	20,925,769	29,220,264
1895	23,048,515	32,000,989
1896	25,338,103	41,160,877
1897	16,094,557	57,497,872
1898	12,626,431	70,406,885

It will be seen by a comparison of the figures for 1898 with those for 1880 that the ratio which the value of domestic exports bore to the value of the imports has been almost exactly reversed, and that this change has come about chiefly since 1892 when the value of the exports and imports nearly balanced for the first time. The extraordinary excess of the domestic exports has, as will be seen from the table, taken place since 1895. At the beginning of 1899 the indications were that a larger exportation would take place than in any preceding year. Among the exports many articles were included which in former years were never manufactured for exportation. The above figures give the exports and imports only for the fiscal years. For the calendar year 1898 the figures are still more remarkable, the total value of the exports of iron and steel manufactures for the calendar year 1898 being \$82,774,958, and of the imports, \$8,052,796.

The following table showing the iron trade of foreign nations was prepared by Mr. J. M. Swank for the United States Geological Survey:

Iron Trade of Foreign Nations.
GREAT BRITAIN.

YEAR.	Production Iron Ore.	Imports Iron Ore.	Exports Iron Ore.	Production Pig Iron.	Exports Pig Iron.	Production Bessemer Steel.	Production Open Hearth Steel.	*Total Steel.	†Exports Iron and Steel.	Production Bessemer Steel Rails.	Imports Iron and Steel.
1894.....	Long tons. 12,867,308	Long tons. 4,875,989	Long tons.	Long tons. 7,427,842	Long tons. 880,985	Long tons. 1,585,384	Long tons. 1,575,318	Long tons. 3,210,702	Long tons. 2,849,988	Long tons. 698,580	Long tons. 282,908
1895.....	12,615,414	4,887,158	.....	7,703,459	896,568	1,585,225	1,754,737	3,389,982	2,835,541	604,838	311,486
1896.....	.....	.....	.....	8,568,209	1,059,796	1,815,842	2,317,555	4,283,397	3,552,286	817,476	380,770

FRANCE.

	Metric tons.	Metric tons.	Metric tons.	Metric tons.	Metric tons.	Metric tons.	Metric tons.	Metric tons.	Metric tons.	Metric tons.	Metric tons.
1894.....	8,772,101	1,638,000	248,000	2,089,714	117,990	646,000	.....	674,190	.....	188,000	166,957
1895.....	8,679,767	1,651,000	237,000	2,008,968	161,307	691,000	.....	714,523	.....	152,000	210,886
1896.....	.....	1,862,000	288,000	2,338,702	196,308	.....	.....	863,508	.....	.....	288,075

GERMANY.

YEAR.	Production Iron Ore.	Imports Iron Ore.	Exports Iron Ore.	Production Pig Iron.	Imports Pig Iron.	Exports Pig Iron.	Production Steel.	Production Steel Rails.
1894.....	Metric tons. 12,392,065	Metric tons.	Metric tons.	Metric tons. 5,890,088	Metric tons. 211,848	Metric tons. 232,370	Metric tons. 8,641,624	Metric tons. 668,819
1895.....	12,349,600	.....	.....	5,464,501	199,556	220,108	8,962,775	498,855
1896.....	14,162,315	.....	.....	6,374,816	337,181	192,915	4,796,228	.....

The imports of iron ore into Germany and Luxembourg in 1896 were 2,596,705 tons, and exports 2,642,384 tons.

BELGIUM.

1894.....	811,222	1,942,883	258,529	818,597	227,426	.....	841,318	118,061
1895.....	812,637	1,357,623	828,437	829,234	226,665	.....	867,947	128,367
1896.....	.....	.....	.....	932,780	.....	.....	498,765	.....

* Includes crucible and other steel.
† Includes pig iron, and iron and steel rolled into finished forms.
‡ Includes steel rails and miscellaneous steel.
§ Including Luxembourg.

AUSTRIA-HUNGARY.

Year.	Iron Ore. Met. Tons.	Production. Pig Iron. Met. Tons.	Steel. Met. Tons.
1894.....	2,115,222	1,072,357	705,650
1895.....	2,340,173	1,127,673	780,630
1896.....	.....	.....	.....

SWEDEN.

Year.	Iron Ore. Met. Tons.	Production. Pig Iron. Met. Tons.	Total. Steel. Met. Tons.
1894.....	1,927,212	462,809	168,740
1895.....	1,904,662	462,930	197,830
1896.....	.....	488,400	.....

The pig iron imported into Austria-Hungary in 1895 amounted to 175,400 metric tons, against 138,849 in 1894, 75,621 in 1893, 66,096 in 1892, and 59,710 in 1891. The exports are inconsiderable.

The total exports of iron ore from Sweden amounted, in 1896, to 1,150,695 metric tons, against 800,452 in 1895, 831,395 in 1894, 484,055 in 1893, and 320,071 in 1892.

In 1896 the exports of pig iron from Sweden amounted to 70,747 metric tons, as compared with 86,368 tons in 1895, 67,026 tons in 1894, 59,836 tons in 1893, and 57,502 tons in 1892. The exports of all kinds of iron and steel bars from Sweden in 1896, not including wire rods, amounted to 180,515 metric tons, against 177,086 tons in 1895, 150,270 tons in 1894, 162,717 tons in 1893, and 179,388 tons in 1892. The exports of wire rods alone in 1896 amounted to 5,748 metric tons, compared with 3,734 tons in 1895, 1,782 tons in 1894, 1,713 tons in 1893, and 4,605 tons in 1892.

SPAIN.

Year.	Iron Ore. Met. Tons.	Production. Pig Iron. Met. Tons.	Total. Steel. Met. Tons.
1894.....	5,352,353	223,798	90,934
1895.....	5,514,339	206,452	73,254
1896.....	6,808,000	246,326	104,577

RUSSIA.

Year.	Iron Ore. Met. Tons.	Pig Iron. Met. Tons.	Production. Cr'de St'l. Met. Tons.	St'l R'ls. Met. Tons.
1894....	2,487,225	1,332,489	703,058	242,510
1895....	.....	1,454,325	769,900	.....
1896....	.....	.....	.....	.....

The world's total iron and steel production for the years 1894, 1895, 1896 was:

Year.	Pig Iron. Tons.	Steel. Tons.
1894.....	25,600,000	14,039,000
1895.....	28,871,000	16,449,000
1896.....	.....	.....

The imports and exports of iron ores and pig iron in Europe for 1897, were as follows, the figures being in metric tons:

	Iron Ores.		Pig Iron.	
	Imports.	Exports.	Imports.	Exports.
Austro-Hungary	134,778	547,856	462,122	168,779
Great Britain.....	5,968,680		364,032	27,416
Germany	3,185,644	3,230,291	164,629	12,084
Belgium	2,544,418	409,768	125,002	210,411
France	2,137,901	289,694	39,988	1,588,058

Minnesota.—The deposits of ore in this range are to be considered as among the most wonderful which have ever been discovered. The ore-bodies lie on the southern slopes of the Mesabi range, and are covered by a mantle of glacial drift varying from 4 to 100 ft. in thickness. The ore is mostly hematite, which occurs in a rotten quartzite, and as a result of this decomposition (a character produced by the chemical

action which deposited the ore), the material is so loose that it can be mined with a steam shovel. The ore is high grade, siliceous, and low in phosphorus, and this, together with the low cost of mining, has enabled it to crowd out ores, of sometimes greater purity, in many markets of the east and south. Hibbing and Virginia City are the two most important mining towns of the district.

Alabama.—The Birmingham district of Alabama is the second great iron ore producing region in the United States. The ore, which is hematite (sometimes known as Clinton, pea, or fossil ore) can be traced for a distance of 130 miles, but the chief mines are in Red Mountain, near Birmingham, where the main bed varies from 12 to 20 ft. in thickness, and is opened up at many points for a distance of four miles. The ores have been formed by the leaching of the lime carbonite from a ferruginous limestone, and consequent concentration of the iron. Faulting of the strata has brought the ore beds into close proximity with coal and limestone, thus producing ideal conditions of supply.

Foreign Iron Ores.—The question of iron ore supply is becoming one of vital importance to European manufacturers of iron and steel, for many of the European deposits that have served as sources of supply for years, give indications of exhaustion. In recent years the Bilbao mines of Spain have been the chief reliance of English manufacturers, but in a few years other sources will have to be considered. Sweden may then serve the British market, although most of her extensive, but undeveloped iron ores contain too much phosphorus to be available for Bessemer steel. The Styrian iron ores run low in phosphorus, and there is still an abundance of them in sight, but their use is limited to the continent. Russia also contains abundant supplies. The iron mining industry of the Ural Mountains has fluctuated frequently, and is still undeveloped to a large extent. The mining methods employed in the Urals, which contain the richest iron resources of Russia, are very primitive, as only hand and horse power are used, and consequently only the most accessible portions of the deposits have been touched. The iron ores of the northern Urals are the poorest and those of the southern end are the richest. Large beds of limonite have recently been found on Kertsch and Taman in the Sea of Azof. The ore runs 38 per cent. iron, 1.55½ phosphorous and the beds are 15 to 35 ft. thick. The furnaces of southern Russia have hitherto been dependent on the Krivoi-Rog district for their ores.

Bessemer Steel Production in the United States for 1898.—The total production of Bessemer steel ingots in 1898 was 6,609,017 gross tons, against 5,475,315 tons in 1897, showing an increase in 1898 of 1,133,702 tons, or over 20 per cent. The production of 1898 was much the largest in our history. Of the total production, 3,539 tons were steel castings. The following table gives our production of Bessemer steel ingots and castings in the last two years:

1897.....	5,475,315 tons
1898.....	6,609,017 tons

The following table gives the production of Bessemer steel ingots by States, in gross tons:

	1897.	1898.
Pennsylvania	3,060,049	3,402,254
Ohio	1,041,541	1,489,115
Illinois	943,774	1,105,040
Other States	429,951	612,608
Total	5,475,315	6,609,017

Last year Pennsylvania made 57.5 per cent. of the total, Ohio 22.5, and Illinois 16.7 per cent. These three States made 90.7 per cent. of all the Bessemer steel, only 9.3 per cent. being made in all the other States.

The production of all kinds of Bessemer steel rails by the producers of Bessemer steel ingots in 1898 was 1,955,427 gross tons, against a similar production in 1897 of 1,614,399 tons, and 1,102,892 tons in 1896. The following table shows the production by States of Bessemer steel rails by the producers of Bessemer steel ingots in the last two years, in gross tons:

	1897.	1898.
Pennsylvania	1,024,386	1,052,771
Other States	590,013	902,656
Total	1,614,399	1,955,427

The production of Bessemer steel rails weighing 45 pounds and less than 85 pounds

to the yard are separated from those weighing less than 45 pounds and over 85 pounds and are as follows:

	Under 45 lbs.	45 lbs. and less than 85.	85 lbs. and over.
Pennsylvania	67,558	670,290	314,923
Other States	52,368	712,343	137,945
Total	119,926	1,382,633	452,868

This shows the continued increase in the use of heavy sections of rails. No less than 23.2 per cent. of all the rails made were over 85 pounds to the yard, while 70.7 per cent. were between 45 and 85 pounds, the larger proportion being probably over 60 pounds. Only 6.1 per cent. were below 45 pounds.

It appears from the statements above that about 34 per cent. of the total production of Bessemer steel was made into rails, leaving 66 per cent. for other uses.

IRON CLAY. See OCHRE.

IRON HALL, a secret and benevolent society. Its supreme office is 815 Equitable Building, Baltimore, Md. Supreme President, Freeman D. Somerby; Supreme Secretary, E. C. Perkins.

IRRIGATION. The most notable feature of irrigation development to-day is the need of some means of settling conflicting claims to water rights and thus stopping litigation that is becoming almost overwhelmingly burdensome. Next to this may be mentioned the need of more information regarding the duty of water, or the actual areas of different crops which a given quantity of water will serve. Both these points, and many others, the U. S. Department of Agriculture is now seeking to clear up through the coöperation of the agricultural experiment stations in the different States where irrigation is practised. The work was inaugurated in 1898, with Mr. Elwood Mead, State Engineer of Wyoming (office at Cheyenne), as Engineer in Charge. The engineering and agricultural questions connected with irrigation, save the duty of water, are now pretty well settled. Especially, is it realized that more care must be taken in the distribution of water to prevent losses by evaporation, and by seepage through canal banks. Where intense culture warrants the expense, water is being distributed through pipes, notably in southern California. The Colorado experiment station, at Fort Collins, Col., is doing much good work for irrigation, and praiseworthy investigations are also being made by the Wyoming, Arizona, and Utah stations. Private capitalists have not been so successful, financially, in the development and distribution of water for sale to irrigators as was expected a few years ago. This is partly due to the unsatisfactory legal status of water rights; but it is largely owing to a feeling on the part of water takers that these companies are imposing monopoly rules and prices. Irrigation districts have been authorized and formed in some States to enable the cultivators of the soil to build irrigation works in common and thus control their water supply independent of water companies, great or small. Many such districts have been formed in California, but partly because of opposition by irrigation companies and by taxpayers who opposed the necessary expenditures, and partly because of lack of expert legal, engineering, and financial advice, comparatively few of these districts have carried their schemes to successful completion. Bitter litigation against the California districts resulted in decisions in favor of the Wright Irrigation Districts Act in all the California courts. The U. S. Circuit Court for southern California declared the act unconstitutional in 1895, on the ground that it took private property for public use without due process of law, but in 1896 the U. S. Supreme Court reversed this decision. Notwithstanding this, the irrigation districts have not yet completely rallied from the attacks of their opponents and the consequences of their own errors.

To the close of 1898, Wyoming was the only State in which irrigation works had been constructed under the so-called Carey Act. There, two companies, under contract with the State, had built irrigation districts, and one of them had furnished water to settlers. It was later reported that a contract had been let for a similar ditch in Montana. The act was an amendment to the Sundry Civil Service Bill of 1894. It provides for the cession by the U. S. to each of the States in the West in which irrigation is practised, of 1,000,000 acres of arid land, provided such land is selected within ten years of the passage of the act and reclaimed and settled within five years of the approval by the U. S. of the selection. Some of the people of the West feel that much more would have been accomplished under the act had it not been for unreasonable rulings at Washington. There is also a strong feeling in the West that the East does not appreciate the real significance of irrigation and public land questions in the West. See SEWAGE PURIFICATION and WINDMILLS.

In 1896 the United States Geological Survey began issuing a series of special bulletins on irrigation investigations and related subjects. Those issued during 1898 deal chiefly with irrigation systems in use in portions of Texas, California, and Ne-

braska, treating not only of their advantages and cost, but also pointing out possible improvements. See also ARTESIAN WATERS.

ISIS LEAGUE OF MUSIC AND DRAMA. See UNIVERSAL BROTHERHOOD.

ITALIAN LITERATURE. There has been little that is notable in the past twelve months' production, notwithstanding the appearance of the long-expected and somewhat disappointing *Città Morta* of d'Annunzio. Indeed, the question of the hour is not so much what individual works have been produced as whether since 1870 any literature possessing a national character has been produced in Italy. Ugo Ojetti, a prominent younger critic and a follower of d'Annunzio, frankly concedes there is no contemporary Italian literature, and welcomes this state of things as marking the triumph of individualism. Carducci, on the other hand, who, like Brunetière in France, stands for classicism, takes the opposite view and fiercely inveighs against writers whom he designates as "the gad-flies of cosmopolitan literature." As a matter of fact, however, the younger writers, while showing in their plays, novels, and poems, their debt to Russian, French and Scandinavian schools, are nevertheless fundamentally and unmistakably Italian in the epicurean tone of their conceptions and the artistic symmetry of their works.

History.—The most important book of the year, both for its literary and scholarly qualities, is undoubtedly the opening volume of Professor Ettore Pais's new *History of Rome*, which is to form part of his projected series covering the history of ancient Italy begun some years ago by his *Sicily and Magna Grecia*. Professor Pais is a ruthless destroyer of tradition, and he seems destined to establish the records of Rome on a firmer basis than even Mommsen has done. Gaetano San-Georgio, Professor of History at the Institute of Milan, has published an important *History of the Commerce of the World*, in which he seeks to show that the Italians are less gifted than other nations with the expansive force necessary for success in the struggle for the world's commerce. A work which fills an important gap in historical and political literature is *Fifty Years of the Parliamentary History of the Kingdom of Italy*, by Edoardo Arbib, the first volume of which has just appeared. It is based entirely on parliamentary documents, and shows not only great diligence, but a broad-minded conception of his theme. Other works deserving of mention are *The History of the Italian Revolution During the Period of Reform (1846-48)*, by Gori Agostino; *Ravenna and Romagna From the End of the 12th Century to the End of the 19th*, by Silvio Bernicoli; and a new volume of *Historical Studies on ancient Piedmont*, by C. A. di Gerbaix-Sonnaz.

Biography.—Almost every month witnesses the publication of documents or memoirs dealing with the heroes of the Independence movement. Two of the most interesting of these are the Letters of *Silvio Spaventa*, and *Unpublished Letters of Giuseppe Mazzini and his Companions in Exile*. During the year two important volumes on Silvio Pellico have appeared: *Unpublished Poems and Letters*, containing eleven poems written by Pellico during his incarceration, and twenty-seven letters written after he was liberated; and *The Life and Works of Silvio Pellico*, by Ilario Rinieri, based on unpublished letters and documents, and throwing important light on his relations with Foscolo, Monti and others. There is also a volume of *Unpublished Letters of Giuseppe Giusti*, edited by Dr. G. M. Giusti. Other works deserving of mention are: *Memoirs of Francesco Baggi*, by Corrado Ricci; *Unpublished Memoirs of Ferdinando Ranalli, the Last of the Purists*, by Ernesto Masi; and *Felice Cavallotti in Life, in Politics, and in Art*, an appreciative volume which Paolo Bardazzi has devoted to the genial poet and statesman who recently lost his life in an ill-fated duel. For the past year, however, the interest of critics and biographers has centred in that sombre philosopher and poet, Giacomo Leopardi, the first centenary of whose birth was celebrated at Recanati on the 29th of June. Of the flood of works which that event called forth, the one which has aroused the greatest amount of discussion is a psycho-anthropological study by Professor Patrizi, who attempts, according to the Lombroso method, to reconstruct Leopardi's physical and mental attributes. The most profound and comprehensive studies yet made of Leopardi are *Degli Spiriti delle Forme nella Poesia di Giacomo Leopardi*, by the veteran poet and critic Giosue Carducci, and *Leopardi*, by the Silician novelist, Federico de Roberto. Taken together these two volumes go far toward completing that "history of a soul" which Leopardi's failing health had prevented him from writing. At the same time, Leopardi's almost forgotten manuscripts left in the care of his friend Raineri, have at last been opened and the first volume of his *Pensieri di Varia Filosofia e di bella Letteratura* has already issued from the press. Other noteworthy studies are: *Giacomo Leopardi*, by the Bolognese poet, Enrico Panzacchi; *Il Leopardi a Napoli*, by Prof. Bonaventura Zumbini; *Per la Storia di un' Anima*, by Ciro Annovi; and *La Donna nella Vita nelle Opere di Giacomo Leopardi*, by Emma Boghen Conigliani.

Poetry.—Giosue Carducci, who has sometimes been called the Browning of Italy, is still the foremost of Italian poets. This year he has produced a collection of short

Rime e Ritmi and one brief but lofty poem, *La Chiesa di Polenta*, based on the legends which have gathered around a very old and tiny church at Polenta, among the Tuscan hills. As usual his lines abound in recondite allusions which make their comprehension difficult. In the circle of younger poets which has gathered around Carducci, the most notable are Enrico Panzacchi, Severino Ferrari, Giovanni Pascoli, Guido Mazzoni and Cesare Rossi. Panzacchi, who like Carducci, is a professor in the University of Bologna, has published a new collection of lyrics, *Rime Nouvelle*. The volume is divided into three sections, *Le Historie*, *Intermezzo* and *Terra Immite*, the last division treating of Italy's late disasters in Africa. Pascoli has published *Minerva Oscura*. Antonio Fogazzaro has once more turned poet, and his *Poesie Scelte* are full of graceful if not very profound fancies. Among the younger poets, d'Annunzio is still the foremost figure, but this year his muse has been silent; meanwhile his *Elegie Romane* have been translated into Latin by Annibale Tennenroni. Two young poets, whose verse shows the influence of d'Annunzio, are Angele Orvito and Alfredo Baccelli. Orvito's volume of *Poesie*, grouped under two subtitles *La Sposa Mistica* and *Il Velo di Maya*, are full of graceful sentiment and aesthetic melancholy; but they lack profundity. Baccelli's *Iride Umana* is his fifth volume of verse, and in it he has endeavored to "interpret the human development of the human soul both singly and collectively." His first artistic canon is that art should reproduce the character of the age that gave it being. Noteworthy volumes by still younger singers are Francesco Pastonchi's *Giostra d'Amore*; *Lo Specchio delle Rose*, by Giuseppe Lipparini, and *Duc Anime*, by Diego Garoglio, which contains, besides original poems, graceful translations from Verlaine, William Morris, Schiller, Camoens, etc. Among female poets, Annie Vivanti and Ada Negri are perhaps the most prominent. The former is represented this year by *Lyrica*; the latter has published nothing since *Tempeste* (1896), but has in preparation a new collection, to be entitled, *Maternità*.

Fiction.—The past year has been especially unfruitful in novels of the first rank, although many interesting announcements are made for 1899. Prior to the advent of d'Annunzio, the Italian novelists were conveniently divided into two opposing camps: the idealists, who drew their inspiration from George Sand and Octave Feuillet, and are represented by Edmondo de Amicis and Antonio Fogazzaro; and the verists, whose origin was in French naturalism and who included the Sicilian writers Verga, Capuana, and de Roberto, and the Neapolitan, Matilde Serao. None of these has lately produced anything of note. Since De Amicis turned socialist, he has written but little; his romance *Maggio*, announced some years ago, belongs to the dim future; meanwhile he publishes a volume belonging to a very different category, but in his characteristically delightful manner: *La Carrozza di Tutti*. Fogazzaro is represented only by two volumes of essays and addresses, *Ascensioni Umane* and *Discorsi*; but he is devoting much time to a novel which will form the counterpart of his successful *Piccolo Mondo Antico* and will be called *Mondo Piccino Moderno*. It is ten years since Verga began his series of *The Vanquished* with the publication of *I Malavoglia*, and five years later the second volume, *Mastro-Don Gesualdo*, appeared. Its continuation, *La Duchessa di Leyra* was at last finished in 1898 and is announced for an early appearance in the *Nuova Antologia*. Since *Giacinta*, Luigi Capuana has written no long novels; he is represented for the past year by a volume of short sketches, *Nuove Paesane*; a story for boys, *Scurpiddu*; and a novelette, *La Nuova Artemisia*. Federico de Roberto, who after a number of unimportant works, made his mark with *I Vicere*, has found time to write, in addition to his *Leopardi* already mentioned, *Una Pagina della Storia dell'Amore*. Under d'Annunzio's influence a new school has sprung up, distinguished for its artistic finish and its morbid tendencies. The most notable of d'Annunzio's followers are E. A. Butti, whose *Illusione* attracted attention in France as well as in his own country, and Ugo Ojetti, who first came into notice a few years ago with a volume of interviews held with d'Annunzio, Fogazzaro and a score of other prominent men. His latest volume, *Il Vecchio*, which has been much discussed, is a painful psychological study of an old man, who having had the sense of his own imminent dissolution impressed upon him by the death of a lifelong companion, broods upon it until, being unable to bear the strain, he hastens his end by suicide. Ojetti was in this country during the late war, in the interest of the *Milan Secolo*, and his impressions of *Victorious America* are announced for early publication. Other novels worth mentioning are *L'Idolo*, by Girolamo Rovetta; *Le Perfidie del Caso*, by Mario Pratesi; *Battaglie per una Idea*, by "Neera," and *Capelli Bianchi*, by Salvatore Farina.

ITALY has an area of 110,623 square miles with an estimated population on December 31, 1896, of 31,290,490.

Production.—Agriculture is the principal occupation of the inhabitants and is carried on under three different systems of land tenure, namely, (1) peasant proprietorship in which the holdings are small; (2) a form of partnership, in which no wages are paid but profits and losses are divided between the partners; (3) the sys-

tem of rent. Of these the first is more common in Piedmont, and Liguria, the second in Tuscany, the Marches, and Umbria, as well as in Lombardy, Venetia, the Abruzzi and Molise, Campania and Sicily; and the third in the north, especially in parts of Lombardy and Venetia. Of the area of Italy about 70.6 per cent. is said to be productive, the chief grain crops being wheat and maize. A large acreage is devoted to the culture of the vine and of silk. The mineral wealth is considerable, the chief minerals being sulphur, zinc, lead, iron, copper, manganese, and coal.

Commerce.—The leading countries from which Italy imported articles of commerce in 1896 were, in order of their importance, Great Britain, Germany, France, Austria-Hungary, Russia, United States, and Canada; and those to which she exported goods were, in order of their importance, Switzerland, Germany, France, Austria-Hungary, and Great Britain. In that year Italy's special trade amounted to 1,173,233,425 lire, imports; and 1,052,097,943 lire, exports, the value of the lira in United States currency being 19.3 cents in 1896.

Army and Navy.—The army organization is based on the law of June 28, 1897, and consists of a permanent army, a mobile militia, and a territorial militia, which, at the beginning of 1897, numbered respectively 216,723; 478,348; and 2,083,924, including officers. The naval administration is organized in accordance with a royal decree issued in 1893. It consisted in December 1897 of 17 battle ships, 2 coast defence ships, 18 cruisers, 272 torpedo craft, and 5 vessels in process of construction.

Finance.—The budget estimates for revenue and expenditure in the years 1897-8 were 1,685,273,752 lire, and 1,674,654,347 lire respectively. The revenue is derived mainly from taxes, of which the direct taxes include an income tax, a land tax, and a house tax, the income tax being the most important. The customs are also an important source of revenue and the State holds a monopoly in salt and tobacco. On July 1, 1896, the amount of the public debt was given at 12,369,561,690 lire.

Religion and Education.—The dominant religion of Italy is the Roman Catholic (see ROMAN CATHOLIC CHURCH). The Protestants and Jews make up a small fraction of the total population. Education is under the control of the government which in recent years has made strong efforts to promote it, devoting a large sum of money to the purpose. At the head of the educational system are the 21 State universities. In 1894-5 the public elementary schools numbered 50,307 with 2,364,321 pupils and besides these there were infant schools, normal schools, various technical schools, gymnasia, evening schools, and a large number of private schools.

HISTORY.

Political Parties.—The political parties in Italy are numerous and constantly shifting. As in several other Continental countries they lack definite aims and permanence. After the establishment of the Monarchy the field was divided between the two great parties standing respectively for the monarchical or conservative principle, and for the liberal, democratic or even republican principle. These parties, however, have since split up into various minor groups. Signor Crispi after holding office for a long term resigned in 1891, and was succeeded by Senor Giolitti. Under the latter's administration the financial condition of Italy was bad and in 1894 Crispi was again called to the head of affairs. During this second ministry of Crispi the bank scandals became an important feature in Italian politics. The Bank of Rome and the Bank of Naples had been wrecked by fraudulent management, and in connection with their insolvency there were rumors of gross extortion and blackmailing. The odium of these reports attached to Crispi in whose ministry the scandals were brought to light, and although it was not believed that he had made use of money extorted from the bank for his private needs, it was generally believed that he was guilty of such extortion and had employed the funds for electoral purposes and for the maintenance of a secret service. The downfall of his ministry, however, resulted from the disaster which befell the Italian forces in the African colony of Erythrea. Early in the year 1896 the Marquis di Rudini succeeded him. The new ministry was obliged to depend for its support on the extreme Radicals. In the elections of March 1897, the Radicals and Socialists gained strength and consequently their influence over the ministry was increased. On November 30, 1897, a Cabinet crisis took place, but resulted merely in the reorganization of the ministry and the Premier di Rudini retained his position. The unpopularity of the monarchy increased with the growth of radicalism. An illustration of the violence of party passion was afforded by an attempt on the life of the King by a workingman. The would-be murderer tried to stab King Humbert, but the latter avoided the blow. The policy of the government toward Erythrea was announced by the ministry on May 14, 1897, when it was stated that the military organization there should be reduced to the lowest possible limits. In the summer of 1897, the Italian plenipotentiary, Major Nerazzini returned from Abyssinia, where he had negotiated a

peace delimiting the frontier of Erythrea. Financial questions became important toward the close of 1897, and though the budget estimates of the financial minister gave a favorable showing, taxation continued to be excessive. The increase of taxation led to a tax riot in Rome, in October, and in the conflict between the people and the police several persons were killed and many injured. The trouble continued during the early part of the year 1898. From February on there were bread riots in different parts of the country, and some of the army reserves were called out.

Causes of the Bread Riots.—The remote but real cause of the Italian bread riots was the general spirit of discontent caused by corruption in the state, party antipathies, and the foreign policy of colonization and territorial expansion which is "too big for the financial means of the country." The immediate cause of the riots was the rise in the price of grain which later in the spring was aggravated still more by the outbreak of the Spanish-American war and the corner on wheat which gave so much notoriety to Mr. Joseph Leiter. In the first part of the year great distress was felt in many districts of Italy, and in February about two hundred people gathered in Florence crying "Down with the tax!" The King thereupon signed a decree reducing the *dazio*, or municipal tax, on grain, and made a personal gift of 8,000 lire to the sufferers in Pisa. The situation was very grave, for the existing system of taxation could not be altered rapidly, and with it the poor could not endure a rise in prices. The really serious bread riots began towards the end of April in the Neapolitan provinces where they raged with especial violence. Within a few days they had spread to most parts of the country, and every large town in Italy, except Rome, was put under military rule. In many places the disturbances were soon put down, but in others even the abolition of the *octroi* failed to prove effectual. The following incident will illustrate the difficulties which local authorities were obliged to meet. After a disturbance in Naples because of the duty on bread the tax was removed. The rioters then clamored against the price which they still thought too high. This, being then reduced to 35 cents per kilo—a trifle more than six cents for a two-pound loaf—the bakers refused to continue business, and the Mayor opened about forty municipal bakeries; whereupon the men thrown out of work joined the rioters. The Mayor was obliged to send them back to their shops by promising to buy their bread, which he in turn sold to the people.

The Riots in the Neapolitan Provinces and Milan.—In the neighboring villages, where the riots were far more serious, most atrocious deeds were committed. The riot in the little town of Minervino Murge in Bari may illustrate. Pillage was begun by a mob chiefly of women; they devastated six private houses and all the public buildings—"town hall, post office, telegraph office, savings' bank, tax-collector's office, [and] *octroi* office. The thirty soldiers sent to quell the riot were powerless and were compelled to retire, while buildings were burned and men and women murdered. In the Neapolitan provinces there was no united effort in the rioting; the disturbances were independent of each other and were caused by imminent starvation, each being a "protest by means of devastation." Violent as they were, they were all put down in a few days and the leaders imprisoned. An Italian authority, Signor Vecchi, differentiated the character of the riots in southern, central, and northern Italy as follows. While the cry in Campania was "*Pane*" (Bread), that in Tuscany was "*Pane o Lavoro*" (Bread and Work); the mobs in central Italy were in search not so much of food for immediate relief, but of work. In Lombardy the cry was for neither bread nor work, but the popular "Down with the government" revealed the truly revolutionary character of the uprising. In Milan the majority of the population is conservative and not ill-disposed to the existing government, but the minority, active and troublesome, eagerly absorbs anti-monarchical principles from the following four publications,—*Il Secolo* representing the advanced Radicals, *La Lotta di Classe*, the Socialists and Anarchists, *L'Italia del Popolo* the Republicans, and *Osservatore Cattolico*, the Clericals. It should be observed that the two enemies of the government who seem to be the real cause for much of the trouble, not only in 1898 but in recent years, are the several groups representing principles of revolution and anarchy, and the papal party, the Clericals, who have never become reconciled to the Pope's loss of temporal power. The Milan riots were precipitated in this way. Out of sympathy with the bread rioters the revolutionary party determined to make a demonstration on May 8, and the notice of May 6 announcing it also clearly suggested that the meeting would be a counterpoise to another to be held on the same date in Turin in commemoration of the fiftieth anniversary of the first Italian Parliament. The proposed Milan meeting was forbidden by the authorities on May 7, and three men caught distributing notices were arrested. An angry mob presently gathered, threatening to invade the building in which the prisoners were confined unless they were immediately released. Thereupon two of the men were released, but the retention of the third so enraged the mob that the well-known three-days' riot ensued. Though the So-

cialist leaders, seeing that the revolt was ill-timed, tried to restrain the people, and *Il Secolo* of May 7, with the same purpose, assured them that the time to strike had not yet come, the disturbance increased, the mobs becoming more and more frenzied with cries of "Down with the King! Down with Savoy!" "Down with the masters! Down with property! Long live Socialism!" The trouble was further aggravated by *L'Italia del Popolo* which said: "To-day the police and the army were thirsty, bloodthirsty; they drank our blood, to-morrow we will bathe in theirs." The rioters erected ninety barricades, but by Monday evening, May 9, the police and soldiers had restored order. At first great loss of life was reported, but it was later announced that the number of those killed was seventy-two and of those seriously wounded sixty-three. It should be noted that Signor Vecchi's statement, that the uprising in northern Italy was entirely revolutionary and in no wise due to the actual sufferings of the rioters, seems somewhat incompatible with the fact that in Milan women, apparently driven to desperation, flung themselves with their babes in their arms beneath the advancing cavalry.

The Vindication of Crispi.—In March 1898, special action was taken against Signor Crispi on the charges in regard to his extortions from the bank. It was decided by a committee of parliament that while there was no ground for impeachment, he should be censured publicly for his offence. Upon the reading of this decision Crispi resigned and appealed to his constituency for a vindication. The result was his reelection in April by a large majority.

Criticism of the Government.—The bread riots of 1898 led to an extended discussion in the magazines of the social and political condition of Italy. Those who were opposed to the present monarchical régime took advantage of these events to point out all the vices of the present government. Though no doubt sincere, these writers showing a partisan bias in attributing the misfortunes of the country wholly to the faults of the administration. Still their charges were so important that it is worth while to notice some of them.

Taxation in Italy during the year 1898 was admittedly excessive. Especially impolitic was the enormous rate levied on plain foods. It was claimed by the opponents of the government that the small gentry throughout the country had been ruined by this taxation. The sale of small houses or single farms on account of the inability of the owner to pay the taxes was a matter of frequent occurrence. The tax on salt and the tax on matches are often mentioned in illustration of the bad financial policy of the government. Both these articles are the necessities of the poor and the enormous tax placed on them renders them dear to all classes of society. Many cannot afford to use salt at all, and on the coasts if a peasant attempts to obtain a little salt by the evaporation of sea water he is heavily fined. It is also claimed that the cumbersome system of red tape and officialism exposes the poor citizen to continual injustice and oppression. And a still worse form of oppression comes from the tendency of the authorities to protect the police in an arbitrary and tyrannical course of action. Many instances of unjustifiable arrests have been cited in which the gendarmes received no reprimand from the authorities. On the other hand, where the people have been clearly in the wrong the government is accused of weakness or timidity. Its critics declare that while it has for a long time persecuted socialism, it has been guilty itself of the most glaring acts of state socialism; in other words that it does not hesitate to adopt socialistic measures for the sake of winning popularity, although it sternly represses anything of a socialistic nature which tends to weaken its own prestige.

Again it has been said that the government protects its friends from the consequences of their crimes and many instances, on more or less doubtful authority, have been cited in illustration. At the same time the crimes of the poorer classes of society are said to be punished with ferocious severity and of this such matters as the arrest of humble citizens for the purchase of a picture of the Pope and the infliction of excessive punishment for the mere use of discourteous language toward officials have been cited in proof. The carnage at Milan has been condemned as wicked and unnecessary. It is said that every effort is made to crush the manliness and natural feeling out of the soldiery, but in spite of this the sympathy of the latter remains with the oppressed common people. The muzzling of the press, the imprisonment of journalists, and the sending of scientific writers into "enforced residence," are also quoted as signs of the prevailing "paternalism." Space does not permit a further account of the indictment which these writers, probably influenced by clerical or republican partisanship have brought against the government of King Humbert. Part of their charges are doubtless based on fact, but they carry in themselves the proof of exaggeration.

Defence of the Government.—As to the arbitrary character of some governmental acts it must be remembered that the Italians are more inflammable than the people of some other countries and that they act quickly upon impulse. Seemingly harsh repressive action is often necessary to prevent serious results. As to the

general condition of Italy it is acknowledged that both in respect to education and in respect to economic prosperity the improvement under the monarchy has been remarkable. The percentage of illiteracy is said to have decreased from 80 per cent. in some parts of the country, to hardly more than 20 per cent. and it is believed that the people are in general better housed and better fed than they were at the time when Italy was at the mercy of foreign masters. Judging from the statistics of the savings banks, it would seem that there was not only an increase of wealth, but that this wealth had been more widely and equitably distributed. An Italian writer points out that while the post-office savings banks in 1886 had a deposit of 211,000,000 lire, they had in April, 1898, 554,000,000 lire.

That the Italian people after long centuries of misrule were not able to govern themselves without making serious mistakes, is freely admitted, but the authors who condemn without mercy the present régime, seem not to have studied the past history of Italy, or to have appreciated the peculiar features of the Italian national life. Foreign observers do not bear out the statements of those who speak of Italy as a decrepit and poverty-stricken country. Many consider her progress in the circumstances, to have been extraordinary. At the same time, there is no doubt that the necessity of heavy armaments has tended to cause excessive taxation and the opposition to militarism is based on some reasonable grounds. When so much is said in regard to the severe censorship of the press, it is well to recall the condition of Italy in this respect under the Austrian régime. Both in the Austrian and Papal States the press laws had been most harsh and a comparison between the old régime and the monarchy in this respect is favorable to the latter. King Humbert has been blamed by some for his heavy civil list. This cannot, however, be attributed to personal avarice. He is required to maintain ten royal residences, for the capitals of the ancient States of Italy each require their own court. He is, therefore, not to be blamed wholly for the expense of this useless display.

The enemies of the government have of course made a good deal of capital out of the failure of the African policy. That it was a failure everybody is willing to admit. The more moderate party, however, would not place the blame upon the government since the "forward" policy was favored by the most intelligent and prosperous part of the population. Its failure was a misfortune, not a crime. In her colonial policy, it was urged, that Italy received the encouragement of England, Gladstone, himself, having advised Crispi to adopt an aggressive policy on the Red Sea coast. The clerical demand that they shall come to terms with the Vatican has met with little response from the Moderate and Liberal parties, who cannot forget their alleged grievances against Rome, and the Moderate party points to the overtures which were made toward conciliation in 1887—overtures which were first encouraged and afterwards condemned by the Pope. Garibaldi's declaration that the patriot always hated the priest has seemed to be true under the present régime, if by patriot is meant one who defends the monarchy. It is certain that a great body of the Italians have not forgotten the alleged evils of the papal rule.

The Ministerial Crisis.—After an investigation into the character of the insurrection it was found upon what was considered conclusive evidence that the socialists were mainly responsible for the rising and that the clerical agitation had in part inspired it. When it came to the adoption of repressive measures, however, serious differences of opinion developed in the Parliament and led to a reconstruction of the ministry of Rudini. This ministry after Parliament had reassembled on June 16 submitted several bills for the maintenance of public order but did not retain the support of Parliament. A motion declaring lack of confidence was brought in and the ministry resigned. After an unsuccessful attempt to form a Conservative cabinet the Parliament united on a Liberal ministry under the premiership of General Pelloux and retaining from the Rudini ministry only the Minister of War. This new ministry was well received on the whole, both by Liberals and Conservatives, and, on July 12, the Chamber was able to unite in passing the "Social Defence" bills. Among the features of the repressive measures were the renewal of the Compulsory Residence Act, the postponement for a year of the elections in the provinces and communes, the right to maintain or modify the state of siege, and to subject the posts, telegraph and railway services to military discipline. In the summer of 1898 the court-martials held at Milan, Florence, and Naples, to try persons accused of having taken part in the recent riots, sentenced a great many to deportation or imprisonment, and, among the persons condemned, there were many journalists and several deputies.

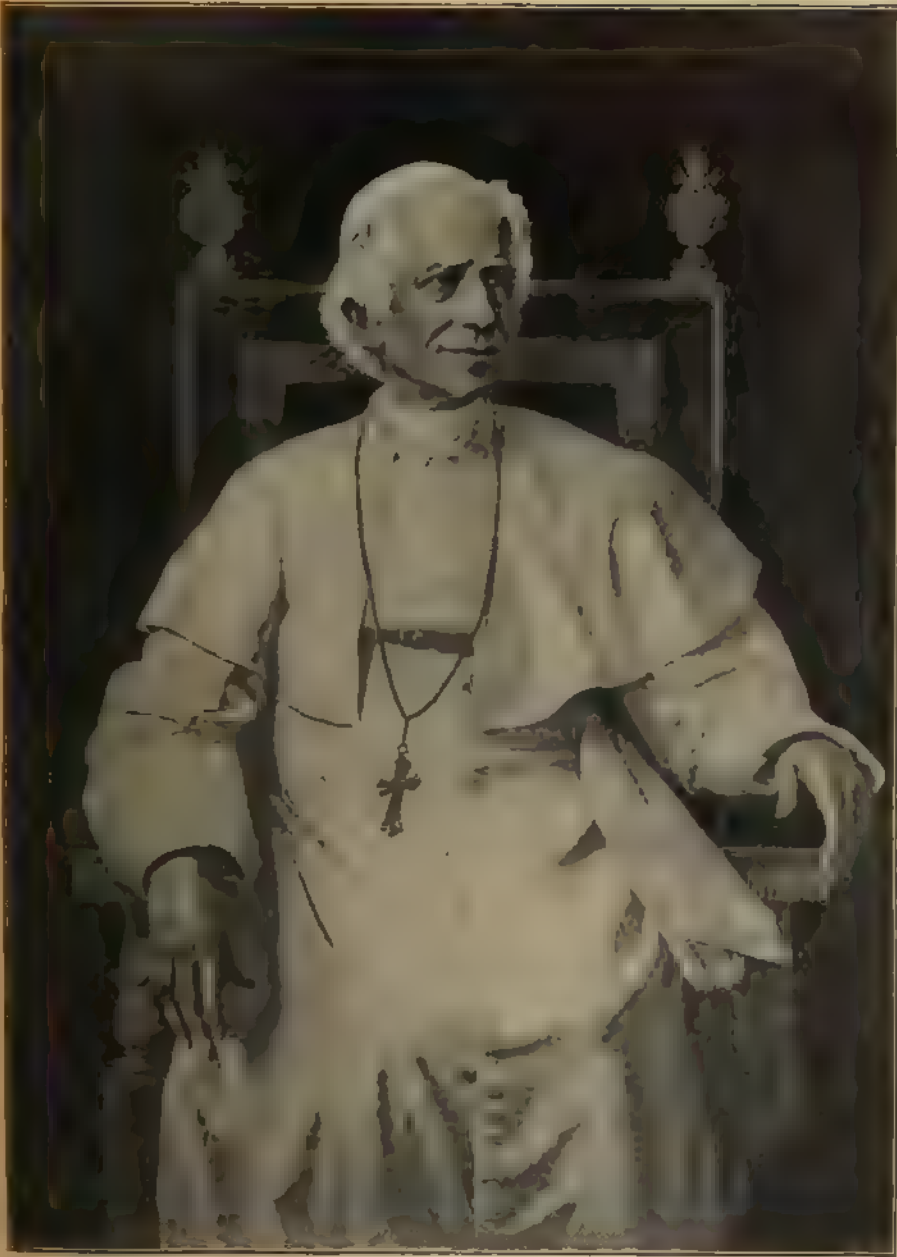
Labor Interests.—On March 17, 1898, a law providing accident insurance for workmen was passed and went into operation in the September of that year. In case of complete permanent disablement the workman receives the proceeds of a life annuity of which the value is five times his yearly wages; in case of permanent partial disablement he receives an amount equivalent to five times the difference between his previous annual wages and the lower rate which he can

still earn; in case of temporary complete disablement he receives each day one-half of his previous daily earnings beginning after five days have passed from the time of the accident; in case of temporary partial disablement he receives one-half of the difference between his previous earnings and the lower rate which he is still able to earn; in case of fatal accident his heirs or legal representatives receive five times the annual wages of the deceased. The cost of first aid is paid by the employer in all cases. Another law passed in July 1898, establishes a national pension fund to which workingmen may subscribe and out of which they receive payments supplementing their wages.

Other Events.—The year 1898 was the sixtieth anniversary of the first mass celebrated by Pope Leo XIII as a priest. It was commemorated all over the world and everywhere the press was united in honoring the character and ability of the Pope. March 2 was celebrated as the Pope's 88th birthday, and as the anniversary of his coronation. In an encyclical published later in the year, the Pope renewed the statement of his policy of improving the social condition of the Italian people. He attributed the sufferings of the people to the burdensome system of finance and the lavish expenditure of the government on increased armaments; and he declared that the State has wasted the wealth which it took from the church when it confiscated ecclesiastical property. He authorized his bishops to promote the welfare of the people by the organizing of parish associations, workingmen's clubs, popular banks, and institutions of all sorts for the advancement of the prosperity of the people. The encyclical contains this sentence: "Though Catholics may submit under compulsion to the existing state, they shall not yield to it their support or allegiance. Their only course is to work for and desire the restoration of liberty and independence to their supreme head. On this head their sentiments can never be changed. To demand their consent to the present order of things is irrational and absurd because directly opposed to the precepts of the Apostolic See, to which they owe unconditional obedience." On March 6 the Radical leader Signor Cavallotti was killed in a duel by Signor Macola, who was afterwards sentenced to thirteen months imprisonment. March 4 was the anniversary of the granting of the constitution by Charles Albert of Sardinia in 1848, and was celebrated by a grand review of the Italian army by King Humbert, who delivered an address on that occasion. See *ARCHAEOLOGY* (paragraph Italy).

JACKSON, General HENRY ROOTES, died May 23, 1898. He was born in Athens, Georgia, June 24, 1820, studied at Franklin College, Princeton and Yale; graduated from the last named college in 1839. After this he was admitted to the bar in Georgia but his practice was interrupted by the Mexican War, through which he served as a colonel of a Georgia regiment. He was judge of the Superior Court of Georgia from 1849 to 1853 and in the latter year became Chargé d'Affaires at the Austrian court. From 1854 till 1858 he was Minister to Austria and in the latter year was chosen Chancellor of the University of Georgia. After the outbreak of the Civil War he became Brigadier-General in the Confederate army and served under Gen. Hood in Tennessee, taking part in the battles of Franklin and Nashville, at the latter of which he was taken prisoner. During the early part of the year 1885 he was Minister to Mexico, resigning the office on June 30 for reasons which he declined to make public. In 1887 he created a considerable sensation by a speech in Macon, Ga., in the course of which he prophesied the final triumph of the principle of local sovereignty against centralized power and declared that Abraham Lincoln had not been the rightful president of the United States but that the title to the office belonged to Jefferson Davis. The speech occasioned much comment both in the south and in the north, but General Jackson subsequently explained that the passage mentioned was merely meant to indicate his belief in local self-government or State sovereignty and not to imply personal disrespect for President Lincoln, whom he honored as a man but whom he believed to stand for a false principle. He was the author of a volume of verses entitled *Tallulah and Other Poems*, published in 1850.

JAMAICA, the largest and most important British island in the West Indies, lies 90 miles south of Cuba and has an area of about 4,200 square miles and a population, estimated in 1896, at 695,865. The area of Jamaica together with the islands governmentally attached to it—Cayman islands, Turks and Caicos islands, Morant Cays, and Pedro Cays—is 4,424 square miles. According to the census of 1891 the whites numbered 14,692, half-breeds, 121,955, negroes, 488,624, and East Indians 10,116. The last named had increased in 1895 to 14,128. The capital and principal town is Kingston (pop. 46,542); other towns of importance are Spanish Town, (5,019), Montego Bay (4,803), Savannah-la-Mar (2,952), Falmouth (2,517). The colony is administered by a Governor (Sir Augustus Hemming, K. C. M. G. in 1898); who is assisted by a privy council and a legislative assembly. Local affairs in the parishes are administered by elective boards. Besides parish magistrates, there are Circuit Courts



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and a High Court of Justice. Besides a militia of about 375, Great Britain maintains a force of about 1,775. The British navy is represented by 12 vessels. Fortifications are placed at Port Royal, Fort Clarence, Salt Pond's Hill, Apostles Battery, Rock Fort, and Fort Augusta. There is no state church. Denominations in order of their size are as follows: Church of England, Baptists, Methodists, Presbyterians, Roman Catholics, Church of Scotland. Government schools for the fiscal year 1896-97 were reported as numbering 924, with an enrollment of 98,359; but the average attendance was only 58,411. There are besides a number of high schools, denominational and industrial schools, etc.

Agriculture is the principal industry; in 1896 there were 182,489 acres under cultivation and 511,185 cared for as pasture lands. The chief products are sugar, coffee, bananas, cocoanuts, and various food plants. The registered shipping for 1895-96 amounted to 127 vessels of 6,968 tons. The railways, which seem to be on a paying basis, aggregate about 185 miles. The telephone and telegraph lines have a total length of 791 and 927 miles respectively. In 1897 the telegraph was not self-supporting. The legal currency is that of Great Britain, but United States money circulates to some extent.

Turks and Caicos islands, Cayman, Morant Cays, and Pedro Cays are under the government of Jamaica. The local government in Turks and Caicos islands is administered by a commissioner who is assisted by a legislative board consisting of five members appointed by the Crown. The administration of the Cayman islands is in the hands of a board of elective vestrymen and of magistrates appointed by the governor of Jamaica.

JAPAN is an island empire of eastern Asia separated from China by the Eastern Sea and the Straits of Corea. It has an area estimated at 148,456 square miles, including Hondo, or Honshiu, the largest island, and, among the other principal islands or island groups, the Chii-shuna (Kurile) islands; Yezo (Hokaido); Kiushiu (the nine provinces); Shi-koku (the four provinces); Idu-kiu (Loo Choo) island; the Ogasawara (Bonin) islands; the Goto, Oki, and Iki groups; and the islands of Sado, Tsushima, and Awaji. By the treaty of Shimonoseki in 1895 China ceded Formosa and the Pescadores islands to Japan, the former having an area of 13,541 square miles and a population estimated at 2,000,000; and the latter an area of 49,000 square miles with an estimated population of 44,820. The population of Japan, according to the census of December 31, 1894, was 41,813,215. The population of Japan is increasing rapidly. On December 31, 1896, a new census was taken giving the total population at 42,708,264, an increase of 437,644 over the previous year.

Agriculture.—Agriculture is the chief occupation in Japan and rice is the staple product. The other crops include tea, cotton, tobacco, wheat, barley, oats, sugar cane, vegetable wax, indigo, maize, buckwheat, millet, potatoes, turnips, beans and peas. Among fruits the pear, plum, grape, melon, and persimmon are cultivated. A United States Consular Report dated September 17, 1898, states that the rice crop of Japan for 1898 was estimated at 7,596,160 tons, an increase of 38.69 per cent. over the preceding year, and of 18.68 per cent. over the average crop. In connection with the raising of rice great attention is paid to irrigation.

Commerce and Industry.—The foreign trade of Japan has developed greatly in recent years. A United States Consular Report dated July 12, 1898, estimates the foreign trade for the year ending June 30, 1898, as follows: exports of merchandise 69,647,099 yen; imports of merchandise 154,840,805 yen; total imports and exports 224,487,904 yen; while the total imports and exports for the year ending June 30, 1897 were 174,112,709 yen. The yen is equivalent to about 50 cents in United States currency. The excess of imports over exports in 1898 was far greater than in the preceding year. This was partly due, perhaps, to the approach of the date for the establishment of the new customs tariff (Sept. 15, 1898). Important articles of export from Japan are rice, tea, raw silk, silk goods, carpets, copper, matches, coal, lacquer, porcelain, floor mats and camphor. In a very large number of articles the trade with the United States exceeds that with any other country. American goods stand a very good chance in the Japanese market, although there are signs that the German merchant has shown himself more skillful than the American in meeting the demands of the Japanese taste and disarming business prejudice. The consuls advocate the better advertising of American goods, and especially the sending of agents to place goods upon the market. There is no prejudice against American manufactures in themselves and the superiority of some is admitted by the Japanese, but they attach great importance to trade-marks and to the doing up of articles in small packages. There is an especial demand for American locomotives, and although England started the railway system in Japan and supplied the lines with locomotives at first, the United States has surpassed her in the value of the locomotives sold in that country. For instance, while in 1895 England exported locomotives to Japan to the value of \$380,935 as compared with \$142,165, the value of those sent from the United States, the exports of locomotives from the United

States in 1898 were valued at \$1,191,906, and those from Great Britain at \$899,130. The imports of wheat and flour from the United States to Japan exceed in value those from all the other nations put together. Great increase has also taken place in the shipment of railroad iron from the United States to Japan, as well as of bar, rod, plate, sheet, and pig iron, and iron nails, bolts and screws. The United States also led the other nations in 1897-8 in the exportation of paper making machinery, dynamo electric machinery, and was becoming an important competitor in mining machinery and raw cotton. Japan exports a great deal of silk, especially to the United States and the continent of Europe. The amount taken by the United States in 1897-8 was nearly twice as much as that taken by all the nations of Europe put together. The trade of Japan with United States and European countries in watches is important. Switzerland has been sending the greatest number of complete watches and the United States of watch parts and materials. The commerce between the eastern coast of the United States and Japan was advanced by the establishment of a regular steamship line between New York and Japan, in 1898, the traffic up to that time having depended upon unattached vessels which sailed at irregular intervals. The Japan Mail Steamship Company maintains regular communication with European, American, and Australian ports and with Bombay and Shanghai.

Japan is very advantageously situated in regard to manufactures. She has a rich supply of coal, an abundance of cheap labor, easy means of communication with China, Australia, etc., and finally a sound monetary system. She has thrown open many of her ports to foreign trade and as years pass, shows a greater desire for commercial intercourse with foreign nations. It has been thought by some that the cheap labor in Japan would attract foreign capital for the exploitation of native industries. The labor, however, is by no means so cheap as it appears to be, since among many classes of the mechanics there is a lack of skill. In a certain watch company, for instance, it was reported that it was not possible to make the business a paying one despite the fact that the Japanese receive only from 20 to 25 cents a day, while in certain American watch factories the wages are sometimes as high as \$3.00 a day. The lack of skill on the part of mechanics was cited as the cause of this. Nevertheless there were in 1898 signs that foreign capital was seeking investment on a large scale in Japan. The manufactures of silk, cotton, and other textiles are important and there are signs of development in many other industries. For instance, Japan has recently made rapid progress in the manufacture of hats, which were formerly imported in large numbers. Ship-building is actively carried on at Nagasaki where there are excellent docks and a large shipyard. In 1898 what was said to be the largest steamship ever launched outside of American or European waters was constructed at that port. See COTTON AND COTTON INDUSTRIES.

Finance.—The total revenue of the Japanese government according to the estimates of the year ending March 31, 1898, was 238,709,484 yen, and the total expenditure 249,547,286 yen, with a surplus from the previous year of 10,815,186 yen. The estimated yield of the land tax was 38,668,991 yen, and that from the tax on *saké*, malt and soy 31,312,404 yen. The revenue from the customs amounted to 6,626,829 yen and from the income tax 1,905,696 yen. Other important sources of revenue were posts and telegraphs, registration dues, state services, the excise, etc. The public debt of Japan on March 31, 1896, was 410,335,135 yen, including both home and foreign debts. The foreign obligations have greatly diminished. In 1889 they exceeded 5,800,000 yen, while in 1896 they amounted to only 233,752 yen. Since October 1897, gold has been the standard of value, the unit being the gold yen, worth about 50 cents in United States money. The paper money in circulation comprises government notes, national bank notes, and the notes of the Central Bank (Nippon Ginko), the total amount on April 1, 1897, being 203,768,357 yen, of which the government issues (1896) amount to 9,045,082 yen.

Currency.—Japan adopted the gold standard by the law of March 8, 1897. The grounds of this action were the fluctuations of silver, resulting in injury to the national department of the country and the general inclination to a gold standard showed by foreign countries. At the time of the passage of this law the Japanese Prime Minister, Count Matsukata, dwelt on these considerations and pointed out that the efforts to secure bimetallism by international agreement had failed several times and that if another conference should be had as was at present expected, it was doubtful if it would reach a definite result. It was his opinion that even supposing that a combination of the powers in favor of international bimetallism was secured in the future, it would do no harm for Japan to adopt the gold standard for the present. It was expected that prices would be steadier in consequence, that the exports would increase, that exchange fluctuations would diminish, and that Japan would be enabled to extend her machinery of circulation. Unfortunately the good effects which were expected to follow from this change were not discernible, for in 1897 and 1898 Japan was suffering from a financial crisis as the result of its too rapid commercial and industrial expansion in recent years. With its extensive investments

and new industries, wages have advanced and the cost of living has increased. The change has given Japan a steady rate of exchange with countries using the gold standard, but it has impaired the power of exchange with China. The government agreed to redeem the old silver yen in gold until July 1, 1898, but for some reason or other comparatively few of them were exchanged for gold. The difficulty of changing to the gold basis in 1897 was enhanced by the excess of imports over exports in that year, resulting in a balance of trade against Japan which had to be settled in gold.

Railways, Posts, and Telegraphs.—Japan possesses an extensive and well managed railway system. On July 31, 1898, the completed mileage of railways was 2,231, and the authorized mileage 3,521. About one-fourth of the railways are owned by the state and three-fourths by private companies. The rolling stock is largely of American and English make, but the woodwork of the carriages is made in Japan. Posts and telegraphs are under government control. In March 1897 there were 11,720 miles of telegraph, and 387 miles of submarine cable. In 1896-7 over 506,000,000 letters, postal cards, packages, etc., were carried in the mails.

Army and Navy.—Both the army and navy of Japan are well organized and demonstrated their efficiency in the recent war with China. The army consists principally of an imperial guard, the six divisions, the reserves, and the territorial army. In 1897 the strength of these bodies on a peace footing was as follows: imperial guard 11,213, six divisions 76,351, reserves 83,080, and territorial army 104,954. Besides these there are the gendarmerie with 1,065 in 1897 and the Yezo militia with 4,577. Counting in the administrative departments and the military schools, the total strength in 1897 was placed at 284,741, officers and men. Since the close of the war with China the government has proposed to raise the number of divisions from six to twelve, increasing the peace footing to about 145,000. In 1897 the navy comprised 66 vessels (including those which were in the process of construction). Of these 17 were in the cruiser class, 13 being deck protected. A new ship-building programme has been decided upon in accordance with which it is proposed to expend nearly \$60,000,000 within a certain number of years upon the building of 19 vessels of various classes and 100 torpedo craft.

HISTORY.

Treaty Relations.—Since the opening up of Japan to intercourse with foreign nations forty-five years ago, treaties have been concluded with these nations and parts of the country have been opened to foreign trade. This trade is carried on through the ports of Yokohama, Nagasaki, Kobé, Osaka, Hakodate, Niigata, and thirteen other ports. By these treaties foreign powers acquired consular jurisdiction in the open districts. In recent years, however, Japan has repeatedly urged the revision of treaties, being moved thereto by the fact that new tariff arrangements were needed, and by the still more important consideration that foreign enterprise was developing so rapidly that foreign trade could not be confined much longer to the limits defined by treaty, while it was not to the interest of the Japanese government that consular jurisdiction should be extended beyond those limits if they should be abolished. An attempt was made to secure revision of the treaties as early as 1871, and other negotiations to this end took place in 1882 and 1885, but all failed in respect of their immediate object. Recently, however, Japan has persuaded the treaty powers to consent to new terms. New treaties have been made with them and these will go into effect after July 17, 1899. They will open the entire empire to foreign travel, trade and residence, and restore to Japan all her sovereign rights which the previous treaties had in some part abrogated. In December 1897, Japan concluded a treaty with Portugal in which each nation guaranteed that the subjects or citizens of the other should have the same rights in its territory as subjects or citizens of the most favored nations. The treaty was to be in force for twelve years. On May 10, 1898, the protocol of an important treaty between Japan and Russia relative to Corea was published. In this the contracting governments recognize the complete independence of Corea. For further deliverances on this treaty, see article COREA.

Political Parties.—Party government in Japan is of very recent origin and the issues between parties are not easy to define. After the new constitution went into force in 1890 the government leaders were taken from the Satsuma and chosen clans but the representatives in the Diet were chosen from two other clans which were opposed to each other. Under their respective leaders, Count Okuma and Count Itagaki, in the Diet parties were divided into Progressives and Liberals. In 1895 an alliance was made between the government and the Liberals, the Premier being Marquis Ito. All parties seemed to be united during the war, but at its close their antagonism was renewed, and in 1897 a Progressive ministry was formed under the Premiership of Count Matsugata, who remained in power until early in the close of the year 1897.

Marquis Ito's Ministry.—When the Diet convened in December it was evident that the Matsugata Cabinet could not command a majority. Count Matsugata resigned

in December 1897, and his resignation was soon followed by that of the rest of the Cabinet. Matsugata now tried to form a coalition with the Progressives under Count Okuma, but failing in this organized an independent Cabinet which was installed on January 12. During Marquis Ito's ministry the above mentioned agreement with Russia in regard to Corea was concluded. Early in May the Japanese minister to England received the final installment of the Chinese war indemnity, which amounted to eleven million pounds. Japanese evacuation of Wei-hai-wei, which was conditional upon the payment of this installment soon followed. (See article CHINA.) As a result of the election in March, the Progressive opposition controlled 104 votes in the Diet while the government had on its side 101 Liberal members. The National Unionists, and Independent party were on the government side at the start and they held the balance of power. It was soon evident, however, that there were serious points of disagreement between the Cabinet and the Liberals and the prediction of a short life for the former proved true. During the brief life of the Ito Cabinet some very important bills were introduced in the Diet. These were, the measures for the enforcement of a civil code; three bills for increasing taxation; and a bill changing in important particulars the method of national elections. The opposition was strong enough to prevent the passage of all but the civil code bill. The passage of this measure was a matter of great importance, since the new treaty with foreign powers which will restore the sovereign rights of the empire throughout its territory provide that the law code must be in operation for a year before the treaties go into effect. Among the changes in taxation proposed, but not adopted, was the increasing of the land tax which, since the law of 1877, has been two and one-half per cent., yielding, according to the budget estimates for the year ending March 31, 1898, the sum of 38,668,991 yen. The new bill raised the rate from two and one-half per cent. to three and seven-tenths per cent. on agricultural lands, three per cent. on rural building lands and five per cent. on urban building lands. In the hope of conciliating the opposition the government extended the session to June 15, but before that date it was evident that the measure would be defeated. The government now favored a scheme for the revision of the land values in the hope of securing a majority for the tax bill, but the opposition refused to give way and the measure was defeated, only twenty-seven members supporting it on the final vote. After this the Diet was dissolved, and on June 26, Marquis Ito resigned his office. The Liberal and Progressive factions had united against the Ito Cabinet, the latter being essentially a non-partisan body and the government called upon the leaders of the new constitutional party, Counts Okuma and Itagaki to form a ministry. In this Count Okuma was Premier and Minister for Foreign Affairs, and Count Itagaki Minister for the Interior.

Count Okuma's Ministry.—On July 19 the Japanese government notified the foreign powers that the new commercial code had come into force on July 1, and the new civil code on July 16. Thus the last great step was taken in the movement for the framing of a Japanese judiciary after western models. It was said of Count Okuma's Cabinet that it was the first party ministry ever organized in Japan. It came into being as the result of a coalition between the Liberals and the Progressives. In the September elections the Constitutional party, as its coalition was called, secured 263 seats in the Diet, a great majority of the members. Nevertheless the coalition proved to be short-lived. A division occurred in the Cabinet over the appointment of a new Minister of Education, and on October 31, all the ministers resigned. Early in November a new cabinet was formed under the premiership of Field Marshal Yamagata.

The rising in Formosa.—In the summer of 1898 there were signs of a rising of the country people of South Formosa, owing it is said, to the harsh treatment which they had received at the hands of the Japanese soldiers in that region. It was reported that Japanese troops on failing to capture some banditti whom they were pursuing had attacked a peaceful village in Formosa and massacred a number of the inhabitants. This, as well as other reports of massacres in the island, have not been authenticated, but in the fall of 1898 there were still rumors of serious disturbances.

JAVA is the principal island in the possession of the Netherlands, being the most important colony of the Dutch East Indies. Its superficial area, including the neighboring island of Madura, is estimated at 50,554 square miles; the population of both islands being estimated at the close of the year 1895 at 25,697,701, of whom 51,489 were Europeans, 257,489 Chinese, 16,569 Arabs, the great mass of the population consisting of native Malays. The capital is Batavia, with 114,566 inhabitants, and the other towns with a population of over 100,000 are Surabaya and Surakarta. In 1895, the European population of Batavia was 8,553. Agriculture is the main occupation, and the soil is fertile, producing rice, maize, sugar, tobacco, indigo, cotton, cinchona, and other crops. The land is owned in part by the government and in part by private persons. A great deal of land has been opened to private enterprise by permission to obtain waste lands on hereditary lease for a term of seventy-five years. By far

the greatest part of the coffee is raised on government lands, or lands leased from the government. In 1895, 48,333,858 pounds of coffee were produced on government lands, and 48,559,186 on lands leased from the government, while the figures showing the amounts raised by the natives and on private lands were comparatively small. The chief articles of export are sugar, coffee, teas, cinchona, tobacco, and tin. The imports include textiles, haberdashery, petroleum, colas, spirits, wine, machinery, powder, and metals. There is a tariff of six per cent. on some articles and a small export duty. The export duty on sugar, however, was removed in 1898. For some time Java has been the principal country for producing cinchona bark, and recently the manufacture of sulphate of quinine has been undertaken on the island. The U. S. Consular Report, dated June 17, 1898, remarks on the favorable prospects which the manufacture of quinine in Java shows and on the increase in the shipment of quinine to the United States. The principal ports are Batavia, Samarang, Surabaya. The monetary system is the same as that of the mother country. The Java bank is controlled in its administration by the government and in the autumn of 1896 the value of its notes in circulation was 44,521 guilders. A postal savings bank was opened in January, and according to the Consular Report of December 1898, its results have been good. The rate of interest was 2.4 per cent., and the bank was organized on the similar institutions in Great Britain. As to the revenues, the chief part is made up of the profits from the sale of coffee, but a considerable revenue is also derived from land, a house tax, tax on estates, customs duties, licenses, personal imports, and State monopolies of salt and opium. In 1897 the proportion of the revenue derived from taxes was 37.7 per cent. from monopolies, 25.4 per cent. from the government sale of products raised under the culture system" (coffee, cinchona, tin and coal) 20 per cent., and from all other sources 16.9 per cent. The budget estimates for 1898 gave the total revenue for the Dutch East Indies as 135,204,203 guilders, and the expenditure 146,150,164. The military organization of the Dutch East Indies is distinct from that of the regular army of the Netherlands, and comprises both natives and Europeans. The strength of this colonial army in 1895 was 1,376 officers and 38,593 sub-officers and soldiers. The Europeans number 16,339, and the natives 19,421, and there are also a number of Amboynese and Africans. Java and Madura are divided for administrative purposes into 22 provinces or residences under a Resident and a number of subordinate officials. The head of the colonial administration is the Governor-General of Dutch East India who is assisted by a council of five members. In 1898, the Governor-General was J. C. H. A. van der Wyck.

The Dutch acquired the island late in the seventeenth century. They have governed it wisely and well with the result that it is now a flourishing colony with an increasing population. A Consular Report dated May 11, 1898, after pointing the advantages that have resulted from the Dutch rule states that the net internal revenue of the colony is about 35,000,000 guilders after paying off the expenses, both administrative and military. One of the characteristics of the Dutch rule has been its effort to elevate gradually the condition of the people who are for the most part exceedingly ignorant and imbued with religious and caste prejudices. One of the means which it has adopted to accomplish this purpose has been the free recourse to the influence of the native sultans and chiefs, who have been maintained in their power and made the allies of the colonial administrators. In other words they have tried to rule the country through the natives instead of forcing upon them a governmental system administered wholly by an alien people.

JEANNE D'ARC, STATUE OF. See SCULPTURE (paragraph Exhibitions).

JENNER, SIR WILLIAM, first baronet, G. C. B., D. C. L., LL. D., F. R. S., physician-in-ordinary to the Queen and Prince of Wales, died at Greenwood, Durley, Hants, December 11, 1898. He was born January 30, 1815, at Chatham; was educated at University College, London, where after studying medicine he became professor of pathological anatomy and of clinical medicine. In 1861 he was made physician-in-ordinary to the Queen; baronet, 1868; K. C. B., 1872, and later G. C. B., "being probably the only medical man who ever received a similar honor." He was president of the Royal College of Physicians, 1881-88. Sir William's early life was attended with many privations, but later he built up an immense practice which, it is said, yielded him—during a period of years subsequent to 1875—an annual income of from £12,000 to £15,000. He was not a prolific writer, but what he did write was masterly. Among his works may be mentioned *Gulstonian Lectures*. His papers on "rickets," published as long ago as 1857-61, were an able treatise. His best known essay is probably *Identity and Non-identity of Typhus and Typhoid Fevers*, in which he showed that the two fevers are different in cause.

JEWS. During the year 1898, the persecution of the Jews continued in many parts of the world, taking the form of violent anti-Semitic outbreaks, especially in Austria-Hungary and France. In France the hatred of the Jews is especially marked among the lower classes of society, including the laboring classes, and it has been

employed by socialistic and radical leaders for party ends. The political importance of French anti-Semitism can be seen in connection with the Dreyfus case. (See FRANCE.) In Austria-Hungary, on the other hand, it is not only the lower classes who are opposed to Jews, nor is the anti-Jewish fanaticism found exclusively in districts where the educational standard is low. Vienna is a great centre of anti-Semitism, the mayor of the city being himself an anti-Semitic agitator. (See AUSTRIA-HUNGARY.) A numerous element of the population in Germany and Italy are also hostile to the Jews. In Germany, the anti-Semites include some of the large landed proprietors, and old nobility. In Russia where the persecution of the Jews has led in recent years to an extensive migration of that despised sect, the persecution seems to come mainly from the official class. The Russian laws discriminate against Jews, forbidding them to live outside of certain specified districts, and to follow certain pursuits. It is this revival of the old-time spirit of persecution in Europe that has led to the so-called Zionist movement for the re-peopling of Palestine by the Jews. An important congress was held to discuss this project in 1897 at Bâle, in Switzerland, and another meeting was held there on August 28, 1898. The second assembly was attended by twice as many delegates as that of the previous year. One of the leaders of the movement was Dr. Theodor Herzl, of Vienna, and the meeting was attended by some of the most distinguished members of the race, including Dr. Max Nordau, who has devoted himself with enthusiasm to the mission of re-uniting the Jews and restoring them to the land of their origin. It was voted at the congress to start a bank for the aid of the Jews in Palestine, the number of those now living in Palestine being considerable. The congress also unanimously adopted a motion for sending a telegram congratulating the Czar on his peace proposal. During the year that had elapsed since the last meeting great numbers of Jews had joined the Zionist movement, and the prospects for its success in 1898 seemed fair. The congress decided to request the aid of the European powers in the furtherance of the Zionist scheme. An obstacle was encountered in the opposition of the Sultan who, in September issued orders prohibiting the immigration of Jews to Palestine.

Jews in the United States.—In 1898 the Jews in the United States reported progress in many directions, especially that of education. Much development was noticed in the Religious School Union of New York, the Jewish Chautauqua, the Jewish Woman's Council, with its meetings, lecture-courses and charitable agencies, the Hebrew Institute of New York, the Chicago Jewish Training Manual School, the Jewish Education Society, and the Jewish Publication Society. Dr. Jos. Kraukopf's National Farm School at Doylestown, Pa., and the Woodbine Agricultural School increased during the year. The latter is under the auspices of the Baron de Hirsch Fund (q. v.). The buildings of the Hirsch Trade Schools and the Clara de Hirsch Working-woman's Home are approaching completion in New York. A few model tenements are being erected in New York by the trustees of the Hirsch Fund. The expenditures of the United Hebrew Charities of New York reached \$121,666, the receipts \$134,775, and there were 19,041 applications for help. Employment was found for 5,889 persons, 305 were sent back to Europe, and 644 transported to various parts of the U. S. The Jewish population in America is estimated at 1,200,000, of whom 400,000 live in New York. There are 570 churches, 301 ministers, and 1,200,000 members. The American Jews took but little interest in the Second Zionist Congress at Bâle and regard with little favor Dr. Herzl and Dr. Nordau's proposed movement. There was a decrease in Russian immigration. The New York Federation of Zionists, organized in 1896, consists of 4,000 members. The Secretary is William Spillberg, 98 East 4th street. Zangwill's visit to America to lecture and study the condition of the Jews was an event of much interest.

JOHNS HOPKINS UNIVERSITY, at Baltimore, Maryland, was organized in 1876; it is non-sectarian. President, Daniel C. Gilman, LL. D. For the year 1897-98 there were 123 officers of instruction and 641 students; of the latter 456 were graduate students, 215 being in the department of philosophy and 241 in the department of medicine. At the close of 1898 the library comprised 85,954 bound volumes, the accession for the year being 3,427. The degrees conferred during the year were as follows: A. B., 46; Ph. D., 36; M. D., 22; proficients in applied electricity, 9. Up to 1898, 2,422 persons had pursued graduate courses, 1,087 degrees had been granted, and in that year 104 degrees were given. Recently the principal source of the income of the university was cut off by the cessation of the payment of dividends on its stocks in the Baltimore and Ohio Railroad. The legislature of Maryland came to the aid of the university in April, 1898, by providing for an annual appropriation to it for two years of \$50,000. Notable gifts were \$5,000 for the library and the collection of meteorological journals, treatises, etc., of Professor Cleveland Abbe of the United States Weather Bureau. During the year a building was added to the medical school, containing physiological and pharmacological laboratories and a medical library; the gymnasium was rebuilt. The annual Turnbull lectures were given by Professor Charles R. Lanman, of Harvard, on *The Poetry of India*, and the Levering lectures

by President Patton, of Princeton, on *Morals and Religion*. See UNIVERSITIES AND COLLEGES.

JOHNSTON, Colonel RICHARD MALCOLM, American novelist, died in Baltimore, Maryland, September 23, 1898. He was born near Powelton, Georgia, March 8, 1822, and his early years were passed on a plantation. He was graduated at Mercer University and practised law until 1857; at that time he accepted a call to the chair of *belles lettres* at the University of Georgia. During the Civil War he was a member of the staff of Governor Brown of Georgia. After the war he managed a boarding school for boys at Rocky, Georgia, and subsequently took up his residence in Baltimore. It is said that "many of his novels and short stories were founded on episodes within his own experience in the South on plantations and elsewhere." He wrote besides his fiction, a life of Alexander H. Stevens (1878), and, in collaboration with Dr. William H. Browne, subsequently professor in Johns Hopkins University, a History of English Literature (1872). Col. Johnston was nearly fifty years old when his literary career began. He created his characters from "his observation of the types then comparatively unfamiliar in the world of letters—the 'Georgia Cracker,' the county judge, the lawyer, the client, the traveler, who were all real people to this genial author, and became hardly less real through his powers of description, to readers all over the country. It is almost impossible to realize now how strange these types appeared only a score of years ago." Among his stories may be mentioned: *Georgia Sketches* (1864); *Dukesborough Tales* (1871 and 1883); *Old Mark Langston* (1884); *Two Gray Tourists* (1885); *Ogeechee Cross-Firings*; *Mr. Absalom Billings and Other Georgia Folk* (1888).

JOKAI, MAURUS. See HUNGARIAN LITERATURE (paragraph Biography).

JONES, Professor HIRAM A., died at Appleton, Wisconsin, April 11, 1898. He was born at Grafton, Mass., December 3, 1831; was educated in Worcester, Mass., and at Wesleyan University, Middletown, Conn., at which he was graduated in 1853. Not long after he accepted a call to the chair of Latin and Greek in Lawrence University, Appleton, and remained a member of the faculty up to the time of his death. For many years he was vice-president of the institution.

JULIUS CÆSAR. See ARCHÆOLOGY (paragraph Italy).

JUPITER'S ATMOSPHERE. See PHYSICS (paragraph Planetary Atmosphere).

JURASSIC. During the past year, fossil fish have been discovered in the Jurassic beds of the southeastern part of the Black Hills Region of South Dakota. O. C. Marsh claimed that certain formations along the Atlantic coast, hitherto considered to be of cretaceous age, are really Jurassic. In some cases direct proof is lacking, while in others strong proof against his views is at hand.

KALNOKY de KOROS-PATAK, GUSTAV SIEGMUND, Count, died at Brünn, Moravia, February 13, 1898. He was born at Lettowitz, Moravia, December 20, 1832. Having entered the army when very young, he resigned in 1850 with the grade of colonel, to enter the diplomatic service. From 1860 to 1881 he represented Austria-Hungary at various courts; he was appointed ambassador to Copenhagen in 1874 and to St. Petersburg in 1880. From 1881 to 1895 he was minister of foreign affairs. Count Kalnoky was known as the Viennese Bismarck and was an earnest supporter of the Triple Alliance.

KANSAS, a central State of the United States with an area of 82,080 sq. m. Capital, Topeka.

Agriculture.—An interesting feature of recent agricultural progress is the remarkable extension of the alfalfa acreage since 1891, when the total area in the crop was 34,384 acres distributed among seven counties having 1,000 acres and upward each. In 1897 the acreage was 171,334, distributed among forty-four similar counties, and the crop was grown to some extent in 103 out of 105 counties in the State. The following shows the production and value of the principal crops in the calendar year 1898: corn, 132,842,048 bushels, value \$34,538,932; wheat, 64,939,412, \$32,469,706; oats, 26,689,248, \$5,871,635; barley, 735,840, \$198,677; rye, 1,710,306, \$632,813; potatoes, 6,906,130, \$3,522,126; and hay, 4,655,016 tons, \$15,128,802—total value, \$92,362,691. The State ranked second in production of wheat; third in hay; and fifth in corn. Live-stock comprised, horses, 734,881; mules, 79,410; milch cows, 680,457; other cattle, 2,076,489; sheep, 231,192; and swine, 1,591,341—total head, 5,393,770.

Manufactures, etc.—At the end of the calendar year 1897, Kansas ranked third among the States west of the Mississippi in the production of coal, the output being 3,054,012 short tons, spot value, \$3,602,326, with the exception of 1894 this was the largest output of the State on record. (See COAL.) In salt the State ranked fourth, nearly tying Ohio, with a yield of 1,538,327 barrels, value, \$488,022. Recent developments in the natural gas regions of southeastern Kansas led to the location in that section of many new industrial enterprises. The total yield from wells in the vicinity of Iola alone exceeded 85,000,000 cubic feet per day during 1897. During 1897 and

1898, the production of zinc was largely increased, and the State gained first place in this industry, the output being 33,396 short tons in 1897 and 21,464 in the first half of 1898. See COAL and NATURAL GAS.

Banks.—On October 31, 1898, there were 101 national banks in operation and 118 in liquidation. The active capital aggregated, \$8,567,100; circulation, \$2,665,680; deposits, \$22,507,499; and reserve, \$7,673,057. There were also 364 State and private banks with capital, \$6,512,976; deposits, \$21,979,267; and resources, \$31,010,377. The exchanges at the United States clearing houses at Topeka and Wichita in the year ending September 30, 1898, aggregated \$49,822,013, an increase in a year of \$6,364,883.

Education.—At the end of the school year 1896-7 there were 419,750 persons of school age in the State, of whom 367,690 were enrolled in the public schools and 254,002 were in daily attendance. There were 9,316 school houses; 11,616 teachers; public school property valued at \$9,395,231; and expenditures, \$3,780,574, including \$2,736,192 for teachers' salaries. The public high schools numbered 174, with 456 teachers and 11,559 pupils; private secondary schools, 18, with 78 teachers and 968 pupils; normal schools, 1 public and 7 private, with 92 teachers and 2,241 students; colleges and universities, co-educational and for men only, 18, with 278 professors and instructors, 3,931 students, and \$246,065 income; colleges for women only, 2, with 28 instructors, 148 students, and \$28,200 income. Professional schools comprised one of technology, one of theology, one of law, and two of medicine. The State Agricultural College at Manhattan, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 703 periodicals, of which 49 were dailies, 589 weeklies, and 54 monthlies.

Finances.—The total assessed valuation as equalized was \$325,370,432 in 1897 and \$325,889,747 in 1898; State tax rate in each year \$4.10 per \$1,000. The legislature in 1897 made appropriations for the biennial term of 1898-99 aggregating \$3,150,000; and fixed the levy for general revenue at four mills, which was expected to yield a total of \$2,526,000, and for payment of interest on the bonded debt at one-tenth mill. The bonded debt on September 1, 1898, aggregated \$632,000, of which \$607,000 was held by State funds, mostly educational.

Population.—The State Department of Agriculture reported the population in 1897 as follows: State, 1,366,789; cities and towns, Kansas City, 41,150; Topeka, 31,842; Leavenworth, 21,536; Wichita, 20,160; Atchison, 15,501; Pittsburg, 12,195; Fort Scott, 11,309; and Lawrence, 10,914.

Kansas, the birthplace of Populism, became a Republican State in 1898, and the sweeping victories which sent seven Congressmen out of eight, seemed to threaten the existence of the Populist party. The rural districts, which have favored the latter cause, turned Republican. The fusion leaders talked of consolidating with the Democratic party. The Kansas legislature had an extra session to enact "suitable legislation for the regulation of railroad charges." Early in February the government lien on the Union Pacific was wiped out at the Union Pacific station in Topeka. The Kansas Pacific road was bought in by Alvin W. Krech for \$6,303,000. He represented the Reorganization Committee and was the only bidder at this sale.

Two million acres of land, formerly owned by the Indians in the State of Kansas and which the government had sold, putting the money into the U. S. Treasury, were restored by the U. S. Supreme Court on April 11, to the Indians. The money amounted to about \$1,250,000.

Besides stock-raising and agriculture, the mineral resources of Kansas showed rapid development.

National Representatives and State Officers.—W. E. Stanley was elected Governor with a plurality of 15,870 votes. The Representatives from Kansas are: Charles Curtis (Rep.), from Topeka; J. D. Bowersock (Rep.), from Lawrence; E. R. Ridgeley (Pop.), from Pittsburgh; J. M. Miller (Rep.), from Council Grove; W. A. Calderhead (Rep.), from Marysville; W. A. Reeder (Rep.), from Logan; and Chester I. Long (Rep.), from Hutchinson. Senators: Lucien Baker (Rep.), from Leavenworth, and William A. Harris (Pop.), from Linwood. Officials: W. E. Stanley, Governor; H. E. Rechter, Lieutenant-Governor; G. H. Clark, Secretary; Frank Grimes, Treasurer; George E. Cole, Auditor; A. A. Goddard, Attorney-General; and Frank Nelson, Superintendent of Education. All are Republicans. Chief Justice, Frank Doster (Pop.); Associates, William R. Smith (Rep.), and W. A. Johnston (Rep.); and Clerk, J. Martin. There are 102 Republicans and 60 Fusionists in the State Legislature.

KASSON, JOHN ADAMS, member of the Anglo-American Commission in 1898, was born at Burlington, Vermont, in 1822; was graduated, 1842, at the University of Vermont; was admitted to the Massachusetts bar; soon removed to St. Louis, Missouri, and then to Des Moines, Iowa. He was made Assistant Postmaster-General by President Lincoln in 1861, and two years later was commissioner to the first international postal congress (Paris). He was a member of Congress, 1863-67, 1873-77, and 1881-85; minister to Austria, 1877-81; minister to Germany, 1884-85. In 1889,

Mr. Kasson was special envoy to the international Samoan congress at Berlin. He was appointed in 1897 special commissioner to promote reciprocity between the United States and other nations, and in 1898 was appointed a member of the Anglo-American Joint High Commission, which was created in May of that year. See CANADA.

KAOLIN. The term kaolin properly includes deposits of white burning residual clay, and is consequently adapted to the manufacture of white earthenware and porcelain. The United States is rapidly developing into an important producer of this material, slowly crowding much of the English product, hitherto used, from the domestic market. The production for 1897 was:

States.	Quantity, tons.	Value.
Colorado	550	\$1,250
Delaware	12,166	99,441
Florida	6,948	39,300
Indiana	1,250	1,000
Missouri	2,498	5,901
North Carolina.....	5,000	40,000
Pennsylvania	8,409	50,482
South Carolina.....	16,000	77,200
Vermont	1,000	7,000
Wisconsin	3,500	35,000

KEELY, JOHN ERNEST WORRELL, inventor of the famous Keely motor, died in Philadelphia, November 18, 1898. He was born in that city September 3, 1837. His early education was meagre. When engaged in the carpenter's trade in 1872 he announced the discovery of a new force, by which he asserted motive power would be revolutionized. He asserted that by musical vibrations air and water could be disintegrated and a powerful "etheric force" be released; he made the most extravagant assertions, saying in 1875: "I propose in about six months to run a train of cars from here (Philadelphia) to New York at the rate of a mile a minute, with one small engine, and I will draw the power all out of as much water as you can hold in the palm of your hand." Experiments were performed with his motors and scientists were unable to find any fraud; all classes became interested and finally \$5,170,000 had been invested in the enterprise. It cannot be said that Mr. Keely diverted to personal uses the large sums invested, for he worked steadily, constructing and discarding between 1874 and 1891, 129 different models. His secret has never been satisfactorily disclosed and the report that after his death hidden apparatus of a suspicious appearance was found in his laboratory tended to confirm the opinion that Keely was the most daring and successful charlatan of his time.

KEENE, THOMAS W., a well-known tragedian, died at the Smith Infirmary, Staten Island, New York, June 1, 1898. He was born in New York City in 1840; his first public appearance was in *The Gunmaker of Moscow* at the Bowery theatre, in New York, in 1865. His favorite characterization was *Richard III*; not long before his death he gave at Providence, Rhode Island, his 2,500th performance in this play.

KENT, JACOB F., Major-General, U. S. volunteers, was born in Pennsylvania in 1835. He is a graduate of West Point and served in the Civil War, being brevetted several times for gallantry and meritorious services. At the outbreak of the war with Spain he was colonel of the Twenty-fourth Infantry, and as major-general of volunteers he commanded the first division of Shafter's army, which was victorious at San Juan hill, July 1, 1898. In October 1898, he was promoted to the rank of brigadier-general, U. S. A., and a few days later was retired at his own request. See SPANISH-AMERICAN WAR (paragraph Fight at San Juan).

KENTUCKY, an east central State of the Mississippi valley, with an area of 40,400 sq. m. Capital, Frankfort.

Mineralogy.—During the calendar year 1897 the State had the largest output of coal in its history, 3,602,097 short tons, spot value, \$2,828,329, an increase in a year of nearly 270,000 tons. It stood alone among the coal-producing States in that two of the fields of the country, the Appalachian and the Central, contributed to its product. It was also one of the most advanced States in the use of mining machines, fully 36 per cent. of the output being taken by that method. The increased production in 1897 was wholly from the Central field. During the year 109 mines were worked and 7,983 persons employed. See ASPHALTUM and LITHOGRAPHIC LIMESTONE.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 85,177,243 bushels, value \$22,997,856; wheat, 14,465,436, \$8,968,570; oats, 9,466,061, \$2,555,836; barley, 22,320, \$8,928; rye, 345,397, \$189,968; potatoes, 2,647,360, \$1,217,786; and hay, 493,278 tons, \$4,488,830—total

value, \$40,427,774. Live-stock comprised, horses, 365,602; mules, 106,547; milch cows, 248,208; other cattle, 341,181; sheep, 597,643; and swine, 1,357,765—total head, 3,016,946.

Manufactures.—In the fiscal year ending June 30, 1898, the State ranked third in amount of internal revenue paid on taxable manufactures (\$18,226,518). There were 523 distilleries of all kinds in operation, and the production was 13,267,791 taxable gallons of spirits, of which 12,557,159 gallons were Bourbon whisky. In tobacco the production was 38,559,873 cigars, 23,600 cigarettes, 38,662,876 pounds of plug, 201,441 pounds of fine cut, 4,309,742 pounds of smoking, and 4,366 pounds of snuff. The clay industries yielded \$806,368 in 1897, principally in brick and tile.

Commerce.—During the fiscal year ending June 30, 1898, the imports of merchandise at the delivering port of Louisville aggregated in value \$271,075, a decrease in a year of \$152,319; exports, nothing.

Railroads.—The railroads chartered by the State have a direct mileage of about 3,050, and the assessed valuation of all railroad property in 1898 was \$42,000,000.

Banks.—On October 31, 1898, there were 75 national banks in operation and 35 in liquidation. The active capital aggregated \$10,950,000; circulation, \$6,867,186; deposits, \$24,947,197; reserve, \$7,796,525. There were also 190 State and private banks, with aggregate capital \$14,202,946; deposits, \$26,688,435; resources, \$51,023,307. The exchanges at the U. S. Clearing Houses at Lexington and Louisville in the year ending Sept. 30, 1898, aggregated \$361,608,868, an increase in a year of \$36,022,249.

Education.—At the end of the school year 1895-6 the last for which detailed reports were available at the time of writing, of the total school population 557,400 were white and 95,400 colored; of enrollment, 337,618 were white and 62,508 colored; of daily attendance, 247,203 were white and 39,658 colored; and of teachers 8,727 were whites, and 1,482 colored. The State Agricultural and Mechanical College at Lexington, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 318 periodicals, of which 27 were dailies, 234 weeklies, and 29 monthlies.

Finances.—The legislature in 1897 authorized the State to issue 4 per cent. bonds to the amount of \$500,000. The validity of the law was tested in court and declared void because of the extent of the existing bonded debt. On appeal, this decision was reversed, and the new bonds were accordingly issued. This issue brought the ordinary bonded debt up to \$1,171,394 on Jan. 1, 1898. In addition to this amount, however, are the bonds held by the board of education, aggregating \$2,312,596, which are not regarded as a part of the regular debt, as they are irredeemable and inviolate and the interest paid on them comes from the revenue of the sinking fund. There was also outstanding in August 1897, a net floating debt of \$1,356,917. The assessed valuations in that year were, real estate, \$444,000,000; personal property, \$109,000,000; railroad property, \$42,000,000—total, \$595,000,000.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 2,150,000. Local estimates gave Louisville, 215,000; Covington, 50,000; Owensboro, 15,000; Henderson, 12,000; Bowling Green, 10,000; Maysville, 8,300; and Winchester, 6,500.

New Election Law.—In March 1898, both branches of the legislature passed the Goebel election law over the Governor's veto. An appeal was taken to the Court of Appeals which in the December following upheld the constitutionality of the law. The measure provides for a State board of election commissioners, which appoints county boards of three members each, which in turn appoint election officers in their respective counties. County boards constitute both the canvassing and the contesting boards in their own counties, and the State board determines contests of officers other than Governor and Lieutenant-Governor, elective by voters of the whole State, and of judges of the Court of Appeals and Circuit Courts and commonwealth attorneys. The law places the entire election machinery of the State in the hands of three men—naturally, for Kentucky, Democrats—and the absence of any non-partisan or bi-partisan provision aroused the indignation of the leaders of all other political parties. This act was passed over the veto of the Governor who, vetoing the latter on March 11, said: "By this bill local self-government is denied the people, and power centralized in the hands of a triumvirate that has more power than any court in the Commonwealth. Clothed with both judicial and ministerial functions, having no legislative attributes, it nevertheless stands out in bold relief the creature of the legislature, beyond the control of courts and juries, the supreme power of the state and absolute master of the people."

Less interest was manifested in the Kentucky elections than in many years. The election machinery has passed into the hands of the legislature and there was a drift towards centralization in the South. An act was passed forcing any foreign corporation, such as the Associated Press, as a condition of carrying on business in the State, to furnish the news and information it gathers to any and all newspapers in Kentucky without discrimination in charges or prices. Heavy fines are the penalty

for non-compliance, and violation of the provisions of this act shall upon conviction operate to forfeit the charter of the corporation.

National Representatives and State Officers.—The eleven Representatives to Congress are: Charles K. Wheeler (Dem.), from Paducah, John S. Rhea (Dem.), from Russellville, David H. Smith (Dem.), from Hodgenville, Albert S. Berry (Dem.), from Newport, Evan E. Little (Dem.), from Owentown, Samuel J. Pugh (Rep.), from Vanceburg, Henry D. Allen (Dem.), from Morganfield, Oscar Turner (Dem.), from Louisville, G. G. Gilbert (Dem.), from Shelbyville, T. Y. Fitzpatrick (Dem.), from Prestonburg, and Vincent Boering (Rep.), from London. The Senators are: William Lindsay (Dem.), from Owentown, and William J. Deboe (Rep.), from Marion. The officials are: William O. Bradley, Governor; W. J. Worthington, Lieutenant-Governor; Charles Finley, Secretary; G. W. Long, Treasurer; Samuel H. Stone, Auditor; W. J. Davidson, Superintendent of Public Instruction; Lucas Moore, Commissioner of Agriculture; W. S. Taylor, Attorney-General; D. R. Collins, Adjutant-General. All are Republicans. Chief Justice, James H. Hazelrig (Dem.); Associates, J. D. White (Dem.), B. L. D. Guffy (Rep.), George Du Relle (Rep.), A. Rollins Burnam (Rep.), T. H. Paynter (Dem.), and J. P. Hobson (Dem.), and Clerk, Samuel J. Shackelford. In the State legislature there are 99 Democrats, 38 Republicans, 1 Populist, and 2 National Democrats. See LOUISVILLE.

KIMBALL, ALONZO S., professor of physics at the Worcester (Mass.) Polytechnic Institute, died in Worcester, December 2, 1897. He was born in 1843 at Centre Harbor, New Hampshire; was graduated from Amherst College in 1866, and for a number of years was a lecturer at Mount Holyoke College.

KINETIC THEORY OF GASES. See PHYSICS (paragraph Planetary Atmospheres).

KING'S DAUGHTERS AND SONS, INTERNATIONAL ORDER OF THE, a religious society of young people founded in New York, in 1886, as a sisterhood whose object was to help the needy and develop the spiritual life of Christian workers. The original ten women who founded the Order, together with officers of the International Order, now form the Central Council. The badge is a small silver cross bearing I. H. N. on one side and 1886 on the other. This society numbers thousands of small centres with a membership of over half a million. President, Mrs. F. Bottome; Secretary, Mrs. Isabella C. Davis. Office, 156 Fifth avenue, N. Y.

KINGSFORD, WILLIAM, civil engineer and historian of Canada, died in Ottawa, Ontario, September 29, 1898. He was born in London, England, in December 1819. Having entered the army he came to Canada with the First Dragoon Guards, but afterwards left the regiment to take up surveying and engineering. He became the first superintendent of the Grand Trunk Railroad east of Toronto, and for a number of years previous to 1880 was the engineer in charge of the Ontario and Quebec harbors. Mr. Kingsford will be best remembered as the author of an exhaustive history of Canada, in ten volumes, from the earliest settlements to the Union of Upper and Lower Canada in 1841; the first volume appeared in 1887 and the last shortly before his death. The degree of LL. D. was conferred upon him by Queen's and Dalhousie Universities; he was a Fellow of the Royal Society of Canada.

KIPLING, RUDYARD. See LITERATURE.

KIRKLAND, WILLIAM A., Rear-Admiral (retired) U. S. N., died at the Mare Island navy-yard, San Francisco, Cal., August 12, 1898. He was born in North Carolina, July 3, 1836, and entered the navy in 1850. During the greater part of the Civil War he served, as lieutenant-commander, on the China station and in the East Indies, but, being recalled, took part in the attack on Mobile. He was appointed to service in the Norfolk and Brooklyn navy-yards, and later at Mare Island. In 1893 he became commodore and in the following year rear-admiral, commanding the European station. He was recalled in 1895 on account of his congratulatory letter to M. Faure on the latter's election to the presidency of France, and on account of his comments on the character of American missionaries in the east. In the month preceding his death he was retired, being at that time senior ranking officer of the navy.

KITCHENER, General Sir HORATIO HERBERT, K. C. M. G., Lord Kitchener of Khartoum, who since 1890 has been Sirdar of the Egyptian army, came into especial prominence in 1898 by his campaign against the Mahdists in the eastern Soudan and his great victory at Omdurman. He was born in England in 1850; was educated at the Royal Military Academy, Woolwich, and entered the Royal Engineers with rank of lieutenant in 1871. From this time until 1882 he was occupied largely in making topographical surveys, the most important being the Palestine survey of 1874-78 and the Cyprus survey of 1878-82. In this latter year he entered the service of the Khedive as major of cavalry; he served in the Soudan campaign, 1883-85. During 1886-88 he was governor of Suakim and for the next four years served as adjutant-general in the Egyptian army, taking part in the war against Arabi in 1889. The victory

of the Mahdists over the English forces under General Gordon in 1884 effectually closed the Soudan, with its population at that time of about 12,000,000, to European civilization and commerce. In 1896 the English organized an expedition for the re-opening of the country, with General Kitchener in temporary command. He had already become prominent by his rapid march to Dongola in aid of the Italians in the spring of 1896, and his capture of that place, and his capacity and enterprise in his new command were so excellent that he was not superseded. The success of this expedition was due largely to General Kitchener's careful and comprehensive plans, his excellent discipline and care of the army, and his systematic working out of the difficult problems of supply; and the success culminated at the battles of Atbara, April 8, and Omdurman, September 2, 1898. Returning to England late in the autumn, General Kitchener was greeted with most complimentary public and official demonstrations and was raised to the peerage with the title "Lord Kitchener of Khartoum." Among other things he suggested that a university be founded at Khartoum, the funds for which were soon raised largely by public subscription. The victory of Omdurman points toward the realization in the not distant future of the plan of Mr. Cecil Rhodes for a railroad "from the Cape to Cairo;" it was generally regarded as a master stroke for civilization. See EGYPT, GREAT BRITAIN, and FRANCE.

KNIGHTS AND LADIES OF HONOR, a fraternal society founded in 1877, has 16 grand lodges, 1,300 sub-lodges, and 70,457 members. Since its organization it has disbursed \$14,009,538 and \$1,144,000 during its last fiscal year. Supreme Protector; L. B. Lockard, Toledo; Secretary, C. W. Harvey, Indianapolis.

KNIGHTS OF GOLDEN EAGLE, a fraternal society founded in 1873, has 16 grand castles, 865 sub-castles, and 65,000 members. Since its organization it has disbursed \$1,559,864 and \$185,175 during its last fiscal year. Supreme Chief, W. C. Hunter, Swedesboro. N. J., Master of Records, A. C. Little, Philadelphia, Pa.

KNIGHTS OF HONOR, a fraternal society founded in 1873, has 36 grand lodges, 2,407 subordinate lodges, and 89,303 members. Since 1873 \$63,819,601 has been disbursed and \$3,918,263 in the last fiscal year. Supreme Dictator, J. W. Goheen, Philadelphia; Supreme Reporter, B. F. Nelson, St. Louis, Mo.

KNIGHTS OF LABOR, organized at Reading, Pa., in 1869, consists of 200,000 members. It regulates industrial matters. General Master Workman, John W. Parsons, New York; General Secretary-Treasurer, John W. Hayes, Washington, D. C.

KNIGHTS OF MALTA, ANCIENT AND ILLUSTRIOUS ORDER, founded in America in 1889, has 5 grand commanderies, 215 sub-commanderies, and 25,000 members. During its last fiscal year it disbursed \$24,211. Supreme Commander, E. W. Samuel, Mount Carmel, Pa.; Supreme Recorder, Frank Gray, Philadelphia, Pa.

KNIGHTS OF ST. JOHN AND MALTA, a fraternal society founded in 1883, has 1 grand encampment, 90 subordinate encampments, and 4,381 members. \$255,237 has been disbursed since its organization and \$37,400 during its last fiscal year. Grand Commander, Millard F. Smith, Brooklyn, N. Y.

KNIGHTS TEMPLARS, a Free Mason society with 43 grand commanderies in the United States, 1,000 commanderies and 112,000 members. Besides these there are subordinate commanderies in Delaware, Idaho, Nevada, New Mexico, Sandwich Islands, Utah, and South Carolina with 1,310 members, making 113,310 in all. The last conclave met in Pittsburgh in October, 1898; the next and 28th triennial conclave will be held in Louisville, Ky., in August 1901. Officers of the Grand Encampment of the United States are: Grand-Master, Reuben H. Lloyd, San Francisco; Grand Recorder, William H. Mayo, St. Louis.

KNILL, Sir STUART, first baronet, created 1893, ex-lord mayor of London, died November 19, 1898. He was born in 1824; educated at the school of Rev. Dr. Worsley, Blackheath, and at Bonn. He was alderman in London, 1885-97, lord-mayor, 1892-93, and alderman again from 1897 to the time of his death. Sir Stuart was the head of the firm of John Knill and Company.

KRYPTON. Prof. Ramsay has recently announced the discovery of a new element from the air to which he gives the name krypton. It is present in very small quantities, 1 part in 100,000 volumes. It belongs to the helium group, and has a density that is greater than nitrogen, 22.47. Its atomic weight will probably be found to be about 80. Its spectrum is closely similar to that of argon. It was first obtained from liquid air. See METARGON, NEON, and XENON.

KUNG, PRINCE, died in May 1898. He was born January 11, 1833. From 1861 to 1884 he was prime minister of the Chinese Empire (q. v.). He fell from power in the latter year but regained some of his influence later. He is reputed to have been the originator of the Tsung-Li-Yamen but in the administration of his office to have been wholly under the control of the Dowager Empress.

LABOR. A very important addition to the literature relating to labor was the work of Professor Emil Levasseur, which appeared in 1898 under the title of *The*

American Workman (*L'Ouvrier Américain*, Paris, 1898). The author is a very distinguished writer on political economy and the economic history of France. He is a member of the Institute of France and a Professor of Political Economy at the College of France, and the Conservatoire des Arts et Métiers. In 1893 he was commissioned by the Academy of the Moral and Political Sciences to investigate the condition of the working classes of the United States and these two volumes on *The American Workman* are the results of his labors. It is the most exhaustive work ever attempted by a foreigner on this subject and it is even said that no other country in the world has received such a complete and satisfactory investigation of its industrial status. The author had visited the United States during the year of the Centennial Exposition at Philadelphia, and in carrying out this commission he returned to the United States seventeen years later (1893), when he was able to note the progress that had taken place between his visits. On the latter occasion he spent five months in visiting farms and factories and in familiarizing himself with the conditions prevailing in all important occupations. He seems to have been actuated by a thoroughly candid spirit and his work is free from that bias which has often disfigured the writings of foreign observers. This gives it a special value to Americans, and it is not only free from the prejudice which a native writer might unconsciously display in dealing with the conditions of his own country, but it covers a wider scope than any similar work by an American writer.

Americans are familiar with the claim that the industrial development of their country surpasses that of any other country in the world. While M. Levasseur deprecates the boastful tone of Americans on this topic, he admits that it is pardonable, for he thinks that the development of industries in the United States is "in its importance, and rapidity a unique phenomenon in the history of the world." Americans are also familiar with the assertion that the American workman has no equal. Here again M. Levasseur finds strong grounds to justify this self-congratulation. The American workmen, he thinks, work harder than those of Europe. The typical member of this class is, in his estimate, superior to any other, and he has attained a higher standard of living than is possible for the European workmen. These facts are due to the American's greater skill, his resourcefulness, his freedom from traditional or professional restraints, and his greater mobility.

That machinery is used to a greater extent and to a far greater advantage in America than in Europe is believed by the author and illustrated by many instances. The American manufacturer, in M. Levasseur's opinion, is marvelously quick in applying devices for economizing hand labor. In illustration of this he says that in 1876, when visiting a certain mill in the United States, the manager showed him as a curiosity a female weaver, who ran seven looms in weaving calico, four in front and three behind her, and that when he told of this afterwards in France, people would scarcely believe him. Yet when revisiting this same mill in 1893, he found an entire row of women managing eight looms apiece. He notes the tendency in America to an increase of production and a decrease of proportionate labor costs, and here he points out the relation between high wages and cheap production. It is well known, of course, that high wages are often accompanied by so high a degree of efficiency that low cost of production coexists with it. It is a familiar truth that low wages do not mean cheap labor. M. Levasseur shows that high wages are not in themselves the cause of cheap production, but that cheap production is an indirect effect brought about by the need of offsetting these high wages by a resort to labor-saving devices. He illustrates this point by saying that if a manufacturer has a chance to introduce a machine costing 50,000 francs, which will displace the work of four operators, who will receive 2,000 francs apiece, it will be to his interest to purchase the new machine, even though it wears out in ten years; whereas in a country in which each operator receives 1,000 francs there would not be any economy in introducing the machine, but on the contrary, a loss on account of the greater cheapness of hand labor.

The concentration of all branches of machine industries in the United States is noticed by the author as a marked feature of the industrial progress of that country. This concentration is said by him to be more rapid than in other lands. Besides the greater readiness of the American manufacturer to introduce new labor-saving devices, another cause which increases this industrial concentration is the extraordinary mobility of the industrial population. While in Europe traditional restraints deter men from leaving an occupation, in the United States the laboring classes move far more freely from one place to another in response to the attraction of higher wages. He thinks the outlook for an extension of the foreign trade of the United States is very hopeful, since the forces which tend toward the cheapening of production are stronger in this country than elsewhere and they show no signs of abatement. That the concentration of labor involves some evil results, he does not question, nor does he attempt to show where the exact limit to freedom of action in trade combinations should be placed. He recognizes the legitimate functions of a trust though he admits that such an association, unless subject to governmental restraint, is liable to abuse.

The old-time dread of so-called over-production has no influence on him. The

growing cheapness of the necessities of life will not, he thinks, lead to unemployment, for while the equilibrium between production and consumption is unstable, this equilibrium always manages to adjust itself, and speaking generally "there is never too much wealth in the world." Here, as elsewhere, in his work he shows a thoroughly optimistic spirit.

As to the condition of the workingman in respect to the protection which the laws give him, he holds that the American is better off than the workingman of any other country, with the possible exception of England. The labor legislation of the United States shows a due regard for his interests. M. Levasseur appreciates the difficulty of making proper laws in regard to trade unionism—laws which will restrain the evil and permit the good results which flow from the organization of labor. A study of the development of trade unionism in the United States has convinced him that the position of the American workman has been strengthened beyond question by means of labor organization. He finds that strikes have been resorted to as frequently in the United States for the remedy of grievances and the readjustment of wages as in any other country. Nor does the history of arbitration in this country show any very promising results. Of profit-sharing and other schemes he does not take a very hopeful view for it seems to him that they succeed only when both the employers and workingmen have more than the average ability and good sense. In regard to wages M. Levasseur accepts the prevailing view that the wages in the United States are higher than in any European country and he believes that their rate of increase since the first half of the nineteenth century has been, on an average, 100 per cent. Nor does he think this applies only to the nominal wage; the actual wage of the American workingman he holds to be far greater than that received by the workingman of other countries and he says that the cost of living to the workingman of the United States is probably even less than to the workingman of France. He considers that the American workingman is better housed than either the French or English operative and that a far greater proportion of the Americans own their own homes. Nor does he anticipate a decline in the future rate of wages. He thinks that he discerns a tendency toward an advance, but not a strong tendency, for should the advance proceed beyond a certain point capital would be deprived of a share sufficient to call it into being. The existence of a growing tendency among the American workingmen to fall in line with the socialists, he admits, although he thinks that they have less reason for their discontent than the workingmen of any other country. In the United States there is a greater equality of opportunity to people of all classes he thinks than in other lands.

The above account is enough to show something of the scope and importance of this work. As the unbiased opinion of a distinguished foreign economist it carries unusual weight. He has shown more care in the sifting of his statistics than is usually practiced by writers on such comprehensive topics as those included in these volumes. For an account of labor troubles during the year 1898, see the article *STRIKES*. See also *TRADES UNIONS*, *CONGRESS OF*, *WAGES*, and the separate articles on countries.

The Nations of Antwerp.—In 1898 there was published in the July Bulletin of the United States Department of Labor an interesting account of the so-called "nations" of Antwerp. Historically these "nations" owe their origin to the different races of merchants represented in the city during the Middle Ages. The racial division corresponded quite closely to the classification by trades, the merchants from certain countries usually congregating in the same trade, so that the term "nation" and trade as applied in Antwerp became synonymous. Each "nation" came to be regarded as a sort of guild and they have lasted down to the present time. In 1829 there were thirty odd "nations" in Antwerp. At the present time they consist of trade organizations made up of a limited membership, each member being a shareholder of the company. New members are taken in on the payment of a certain amount which is either used as capital, or if the capital stock needs no replenishment, is divided among the members. In early times these "nations" were authorized measurers or inspectors of goods from their respective countries, and out of this has grown up restrictions which limit a certain "nation" to the handling of a particular kind of merchandise. One "nation," for instance, will unload cargo of wool from Buenos Ayres, while the work of unloading a cargo of the same material from Australia would be entrusted to another "nation." Thus to a certain degree there is a monopoly, but there is no restraint on the number of these societies, and new ones can be formed if the charges are extortionate. Thus competition comes in to prevent monopolistic results in the same way as it affects other trade societies.

These societies are joint stock companies in which the members are shareholders. The average number of members is between twenty and thirty. The affairs of each society are managed by unpaid officers, elected by the members. The head is the dean, who assigns tasks and collects the amounts due to the society. In the assignment of tasks the dean is supposed to regard each man's special fitness for the work. Should there be no work for him to do he has a free day and does not lose his share of the profits; but on the other hand he must not engage in any other work. The profits are

distributed among the members, but in most cases there is a maximum limit upon the share of the month's profits which a man may receive. When there is a surplus, after dividing the profits, it is reserved and constitutes a sort of sinking fund for the repair of damaged machinery, broken wagons, etc., also to make up for loss through sickness, since a member incapacitated by sickness or injury continues to receive his share for a certain period of time.

On the death of a member his share passes by inheritance to his son or is sold at auction. In the most flourishing "nations" the shares are sold at a premium, but in all cases the purchaser must be acceptable as a member. Anything of the nature of stock jobbing is prevented by the fact that no member may hold more than a single share. The assets and liabilities of the concern are not published and so it is a mere matter of hearsay what the real value of a share may be. The societies are secret and the by-laws which regulate them are not known to outsiders, but they are apparently well managed. Fines are imposed for certain offenses.

Whatever be the means by which they have accomplished their results, it is undeniable that they have met with great success. Every ten years the "nations" submit to the local authorities a statement of their assets and liabilities and some idea of the wealth of these societies may be had from the fact that in 1890 the richest "nation" had a capital of \$180,000 divided into shares of \$5,000 each. The reputation for honesty and skill, in other words the "good will," is reckoned among the chief of these assets, for co-operative societies not being recognized by the Belgian laws, the "nations" can not be legally compelled to adhere to their agreements. Therefore a man will not enter into a contract with a "nation" unless he believes fully in its honesty. Their history seems to present very few instances of fraudulent dealings on their part. The quickness with which these societies carry out their work is remarkable. It is seen to good advantage in the skillful unloading and loading of cargoes, for the dock facilities of Antwerp are among the finest in the world and every effort is made to attract the importer. It is said that vessels of 10,000 tons can be unloaded in seventy-two hours and since they can work on double time this would mean but four days. To complete work with such rapidity of course would be impossible if the "nations" relied on their members alone. They call in extra workmen, and as their sphere of activity has increased, they have become bodies of contractors employing vast numbers of workingmen. These workingmen have not the capital requisite for membership. Thus the institution of "nations" cannot be said to offer any solution to the unskilled labor problem. The system, however, has one especially good point, namely: the prevention of strikes, in which they are more efficient than individual employers could be, because they cannot afford idleness and their interest is in part identified with that of the wage-earner.

The exact statistics of the membership and capital stock of the "nations" is very hard to obtain, but the writer of the article from which the foregoing facts are taken states that at the time of his inquiry the total membership of the "nations" was 1,943 and the total income \$2,934,000.

LABORI, M., was the courageous and able counsel in the trial of M. Zola. At that time he was only 38 years old, but had reached a position of great influence at the Parisian bar. He was counsel for Vaillant, the anarchistic bomb-thrower, in 1894, and on this occasion attracted much attention by the stirring address which he made to the jury. His energy, quickness of wit, and remarkable physical endurance during the Zola trial won applause at times, even from the hostile spectators. He waged a constant battle with the court in order to break through the barrier which was imposed upon the defence from the beginning of the trial. He insisted on being heard, even when what he said bore upon the forbidden topic of the Dreyfus trial, and when he could not speak directly to the point, he managed by his questions and insinuations to drag the Dreyfus matter before the jury. An exciting scene occurred in the course of the trial, when he declared that the falsifiers and hypocrites must not forget that "the name in history which is branded in the pillory as the most execrated, is that of Pontius Pilate." The uproar which greeted this remark was heightened when someone replied, "After that of Judas." His argument, which is said to have been a masterly piece of logic and forensic eloquence, occupied six and a half hours, and was loudly applauded.

LABUAN. See BORNEO.

LADIES' CATHOLIC BENEVOLENT ASSOCIATION, a fraternal society founded in 1891, has 395 subordinate branches, and 33,000 members. Since 1891 it has disbursed \$593,242 and \$178,000 during its last fiscal year. Supreme President, Mrs. E. B. McGowan, Buffalo; Supreme Recorder, Mrs. J. A. Royer, Erie, Pa.

LADIES' UNION RELIEF ASSOCIATION, organized in 1865 for the care and relief of the men disabled during the war of 1860-5, and also of their families. President, Mrs. John A. Kennedy, New York; Secretary, Mrs. M. S. Rogers, 46 W. 51st street, New York.

LADRONES or **MARIANNE ISLANDS**, a group of islands belonging to Spain, situated in the Pacific ocean between 13° and 21° north latitude and 145° and 146° east longitude, with an area of 417 square miles and a population in 1887 of 10,172. The largest of the islands is Guam (q. v.), on which is situated Agaña, the chief city of the islands. Among the other islands are Rota, Tinian and Saypan. A channel divides the islands into two groups. Those in the southern group have a level surface. A coral reef surrounds their coasts leaving good harbors within. The northern islands are of volcanic origin and contain some volcanoes which are still active. The climate is said to be healthful and somewhat cooler than that of the Philippines. The inhabitants are closely allied to the Tagalos, of the Philippines. The original Chamorros, who were very numerous at the time of the discovery of the islands, greatly declined in numbers as the result of the wars with Spain, and those who survived intermingled with the Tagalos so that the resulting population is a mixed stock. Signs of an earlier civilization appear in the ruins of old temples and palaces especially on the island of Tinian. The Spanish rule does not appear to have been favorable to progress. Agriculture has made little advance, and industry and commerce are unimportant. Magellan discovered the islands in 1521. They were taken by the Spanish in 1668 and the name Marianne was bestowed upon them in honor of the widow of Phillip IV. The older name Ladrones, that is, "Thieves' Islands, by which they are now more familiarly known, is said to have been given them in allusion to their piratical practices. By the acquisition of Guam as a result of the war with Spain, the United States has gained the most important of the islands not only in respect to size but in respect to population, Guam having in 1887, 8,561 inhabitants. See map accompanying article UNITED STATES.

LAFLECHE, Rt. Rev. LOUIS FRANCOIS, second bishop of the Roman Catholic diocese of Three Rivers, Quebec, died at Three Rivers, July 14, 1898. He was born at Ste. Anne de la Perade, September 4, 1818; was ordained to the priesthood in Quebec, January 7, 1844. He became in 1864 coadjutor bishop of Three Rivers, and six years later, upon the death of Bishop Cooke, he was advanced to the bishopric. He was also the dean of the Canadian episcopacy.

LAGOS is a district belonging to Great Britain on the Western coast of Africa. It lies about 150 miles east of the Gold Coast, and includes the island of Lagos and a protectorate between longitude 2° and 6° east extending along the coast. The area including the protectorate is 1,500 square miles and the population is estimated at 100,000. During the years 1897-98 Lagos was a prominent topic of public discussion owing to the reported aggressions of the French in the Lagos hinterland. The French maintained that the district in dispute was not covered by the treaties which the Niger Company had obtained from the native chiefs. The rumors of French aggressions having continued a British expedition was sent into the hinterland, and the French retired to Bussa. It was later reported that the French had burned several towns and still retained a foothold in territory claimed by Great Britain. It was to settle this, among other aspects of the West African dispute between France and Great Britain, that the Anglo-French Commission began its session at Paris in November 1897. For the result of this conference see article NIGER TERRITORIES.

LANDS, PUBLIC. The purpose of this article is to show first by way of introduction the reasons which influence the policy of civilized governments in dealing with the question of the public ownership of land; second to discuss briefly the policy of the United States in regard to its public domains; and third to give figures showing the extent of public lands in the United States at the present time.

The question of public ownership of mineral deposits differs in some important points from that in regard to surface land. In all countries in which the present systems of landed property may be regarded as an inheritance from feudal times the ultimate source of private title in such property can always be traced to State ownership, for under the feudal system the government was theoretically the sole land-owner. But while in regard to surface land the principle of private ownership is now generally acted upon there is some divergence in practice among nations in regard to mines. In former times gold and silver were regarded as royal property. The argument which is still urged in favor of the State ownership of minerals is in general that minerals are the free gift of nature, and not to be owned by private persons. Such a principle, for instance, was at the basis of the land policy proposed by the famous French statesman Turgot. In the United States, however, as well as in most other countries, it has become the practice to grant to private persons or corporations not only the surface land but all mineral deposits that it may contain, the grant theoretically including all land between the surface and the centre of the earth. The argument for State control of mineral deposits is stronger in the case of some minerals than of others. In the case of coal and other mineral substances which cover a wide area there seems to be no reason to suppose that competition will not serve to limit prices as effectually as it does in the products of other industries. But on the other hand there are mineral deposits from whose nature or situation there arises a species

of natural monopoly. Such for example are the zinc mines of the United States. The grant of individual ownership in such cases as this is the grant of a monopoly right. A mine may be so superior to other mines as to control the output and determine the price. A monopoly arising from this cause was illustrated for a time in the Hecla copper mines of northern Michigan. In some countries State control of mines even where they do not possess this monopolistic character is still practiced. Others like the United States permit private property in mines whatever be their character.

Private ownership has come about not from ethical or economic considerations on the part of the government, but from experience of the fact that the inducement of private gain was necessary to make men undergo the risk of mining ventures. It has been suggested that this difficulty might be met by adopting in regard to mines the same principle as underlies the patent laws, namely the imposing of certain limitations on ownership. Another method of meeting the difficulty, however, has been applied. This is by means of taxation. Here the rule is laid down that mineral deposits which are widespread and easily discovered should be taxed no higher than other industries while mines which partake of the nature of monopolies should be the object of extraordinary taxation.

To pass on now to the more important subject of the State ownership of surface lands, it is apparent that the principal questions that present themselves are, first, whether the State should retain and cultivate its own domain; secondly, whether it should rent the lands to tenants, and thirdly, whether it should alienate them by sale or grant. As a matter of fact we know that the third method has generally been followed. The question of the government's cultivation of its own estates has a different aspect in the case of forest lands from that which it has in the case of agricultural land. The success of farming of course depends upon a scrupulous attention to details, and such could hardly be expected to result under the direction of State officials. At all events this has been the view of most civilized countries. The governments have sold or grant the lands in fee simple to the occupiers, and the sale or grant of public lands still goes on. The question of the relative efficiency of large and small farming arises only after certain limits are passed. The subdivision of extraordinarily large domains has almost invariably been accompanied by more extensive cultivation. An instance is cited by Beaulieu of the division of three large domains among 107 families under leases running on an average for forty years. While before the division the estates maintained 45 persons, 595 lived on the lands after they were divided. The production of grain, live-stock and vegetables vastly increased and the State received a substantial addition to its revenue.

This principle, however, does not apply to forest lands, which have always been more or less under government control. The administration of the forests is a matter to be regarded from the point of view of social welfare. They exercise an influence upon the rainfall, upon the health of the community, and, it is said, upon the general climatic conditions. At the same time that the State manages the forests for the benefit of society as a whole, it derives a net income from the sale of forest products. This income varies in different countries according to the efficiency of management. In the United States the expenses are estimated at about 75 per cent. of the gross income, in Hanover from 80 per cent. to 85 per cent., in Bavaria about 50 per cent., in Würtemberg 48 per cent. and in Saxony 37 per cent. The sale of forest products, of course, brings up the question of injustice to private industries by the competition of the government. That there is such an injustice in some cases can not be doubted, but efforts are made to avoid it by adjusting the prices of the forest products to the prevailing market prices. Down to the middle of this century the old policy of the government in regard to forests fell into abeyance to some extent and large portions of the forest lands were sold, but during the past 40 or 50 years the State has reverted to its former attitude and retained the forests under its own administration. Not only this, but in some instances the State actually purchases forest lands. In the United States there has been great carelessness shown by the government in this matter. Forest lands have been granted to individuals and private corporations whose only object was to get profits from them at the shortest notice without regard to the interests of the community. Latterly, however, there has been a tendency to pay more attention to this matter. See the article FORESTRY.

The governments, therefore, have in most cases alienated the public land to the occupiers, reserving, of course, the right of taxation. They still have, however, large tracts of land at their disposal and there are some who urge that they should change their policy from a system of land sales to a system of leaseholds, deriving income from rentals instead of taxes. Several governments practice this system and maintain a tenantry on the public lands. On behalf of it it is said that the State has no right to alienate land, that the government should exercise more control over agriculture than it otherwise would, and that the land should yield a far greater proportion of the revenue than it does at present. It is, however, the opinion of most

economists that agriculture has flourished most where the tenure has most nearly approached the system of private ownership, although of course there would not be very much difference between possession in fee simple and possession under a very long lease. The advocates of the leasing of land by the State hold that it would prevent the undue subdivision of land and make it possible for the State, as owner, to introduce and practice new methods of cultivation. Against the former argument it is said that the official determination of the proper size for a farm could not always be relied upon, and in answer to the second plea, appeal is made to the experience of the world in the two methods of cultivation. Some who favor the system of a public tenantry admit the importance of private ownership in the present circumstances, but do not believe that the State should permanently alienate its property. They propose that large tracts of land should be granted, not in fee simple, but on 99-year leases. A financial argument on behalf of State ownership is that if the State retains large tracts of land it can sell them when special financial needs arise, or it can borrow on them as security. The "single tax" theory proposes that the income from land shall take the place of all other sources of revenue, the occupiers to pay the full rental value to the State. These are some of the points urged on behalf of State control, but space is lacking for a further account of them here. Through historical causes the civilized countries of the world have adopted the system of private ownership and public lands are sold to individuals.

The policy of the United States in this respect does not differ materially from that of other countries, but its history shows some interesting changes. After the organization of the government, in 1787, the United States found itself in possession of vast tracts of land which had been possessed by the original colonies. To these lands were added successively wide stretches of territory by the following purchases and cessions: the Louisiana purchase of 1803, the Spanish cession of 1819, the annexation of Texas in 1845, the first Mexican purchase in 1848, the Gadsden purchase of 1853, the Russian purchase of 1867. The first idea of American statesmen was that land should be regarded as the joint inheritance of the people—as so much valuable property, to be used to advantage by the Federal government to supplement taxation and to satisfy the needs of an expanding population. Financiering on the basis of public land was not profitable, and this policy was gradually abandoned, to be succeeded about the year 1820 by the policy which had for its object the use of land to promote industrial and agricultural development of the country. According to this policy the land was made virtually free. At first \$2 an acre was the price, but this was afterwards reduced to \$1.25 an acre, and finally, in 1830, the policy of preemption took shape. The idea of this is that the government shall offer a sort of premium in favor of those who intend to settle and found a home. The idea became stronger that the land was for the benefit of the people and should be granted to landless settlers and not sold to individuals or corporations. The Homestead Act is, of course, an illustration of this policy. The breakdown of the attempt to make the public land a basis for financiering was complete. Compared with the aggregate income, which the government has received from other sources, the net return from the sale of public lands has been only about 2 per cent. during the first century under the constitution.

But while the principle of free grant to individuals has been adopted the government has also used the land for the purpose of encouraging education and the building of railways. Since the year 1775 it has been required by law that 640 acres from every township should be set aside for the support of schools, which amount was doubled by the law of 1848. In 1787 it was also provided by law that to each State should be granted an amount equal to or in excess of two townships as an encouragement to university education and in 1866 the Morrill Bill granted to each State an amount equal to 30,000 acres for each Senator and Representative, to be used for the benefit of agricultural and industrial education. Under these several acts down to the year 1880 there have been granted for common school purposes 67,893,919 acres, for universities 1,165,520 acres, for agricultural colleges 9,600,000 acres. Very extensive grants of land have also been made to railways and canals. Down to the year 1880, when this policy of the United States was discontinued, there were granted to canals 4,424,073 acres, to wagon roads 1,301,040 acres, and to railroads 215,000,000 acres.

Thus the government of the United States has gone on the principle that the best way to make land a source of public income is to sell it. The eleventh census (1890) places the value of real estate, with the improvements, at \$39,544,544,333, out of a total value of tangible property of \$65,037,091,197.

For the year ending June 30, 1897, the number of acres of public land surveyed was 1,061,075,643, and the number unsurveyed was 754,448,745; but this latter estimate does not show the amount of land which is available for agricultural purposes, nor the amount which can be granted to settlers, for it includes the Indian and other public reservations, land claims, sections reserved for public schools, etc. The total

area of public land vacant and subject to entry settlement on July 1, 1897, was 591,343,953. This is exclusive of Alaska with its 369,529,600 acres.

During the fiscal year, ending June 30, 1898, the entire disposals of public lands amounted to 8,453,896.92, showing an increase of 614,780.26 over the year ending June 30, 1897. The acreage of homestead entries for the year ending June 30, 1898, was 6,206,557.61; the cash sales included an acreage of 632,735.74, the Indian lands of 32,193.19, and timber culture and other miscellaneous entries of 1,582,250.38, making the aggregate above mentioned, namely 8,453,896.92. The Commissioner reports that at the present time the unappropriated and unsurveyed public land in the United States, exclusive of Alaska, amounts to 579,368,274 acres, of which more than 94 per cent. are in the thirteen so-called "desert-land" States and Territories. By "desert-land" is meant land which does not produce native grasses in sufficient quantity to make an ordinary crop of hay in usual seasons if unfed by grazing animals, and land which, without irrigation, does not contain sufficient moisture to produce a natural growth of trees or make a sufficient agricultural crop of any kind to render the cultivation remunerative. The vacant lands of this character in the States and Territories are estimated at 332,176,000. The following table, taken from the Commissioner's report shows the vacant land in "desert-land" States and Territories:—

STATES.	Total area.	Desert and grazing.	Barren irreclaimable wastes.	Woodland and forest.	Estimated water supply to reclaim.
	Acres.	Acres.	Acres.	Acres.	Acres.
Arizona.....	54,997,023	29,847,000	15,000,000	9,722,023	2,000,000
California.....	42,591,026	19,871,000	19,000,000	3,928,026	17,000,000
Colorado.....	80,708,561	27,808,000	.....	11,900,561	8,000,000
Idaho.....	44,207,949	17,475,000	.....	26,732,949	7,000,000
Montana.....	71,647,016	49,008,000	.....	22,639,016	11,000,000
Nevada.....	61,358,000	38,500,000	20,000,000	2,858,000	2,000,000
New Mexico.....	66,877,885	40,800,000	.....	9,064,885	4,000,000
North Dakota.....	20,674,618	20,442,000	.....	172,618	500,000
Oregon.....	86,897,869	17,007,000	.....	18,890,869	8,000,000
South Dakota.....	12,882,326	12,071,000	.....	800,326	1,000,000
Utah.....	43,937,896	19,319,000	10,000,000	17,018,896	4,000,000
Washington.....	18,442,642	9,847,000	.....	9,595,642	3,000,000
Wyoming.....	49,081,363	23,000,000	5,000,000	11,071,363	9,000,000
Total.....	546,549,856	332,176,000	69,000,000	145,373,856	71,500,000

To the many million acres which require irrigation in order to yield a remuneration to the cultivator the available water supply suffices for only a small fraction, leaving an estimated area of 260,676,000, suitable only for grazing purposes. A considerable portion of these lands seem destined to remain in their present condition on account of the difficulties in the way of irrigation. Much of the area has an altitude which renders irrigation impossible. These lands cannot under the existing law be appropriated by individuals, unless the latter can show the ability to reclaim them by means of irrigation. Between the passage of this act, on March 3, 1877, and June 30, 1898, only about 125,000 acres have on the average been reclaimed each year, and it is expected that this number will decrease unless Congress provides for engineering works which will render this land cultivable. Several acts have already been passed with this end in view, namely: "the act of October 2, 1888, authorizing the Geological Survey to reserve suitable sites for reservoirs; the act of August 30, 1890, requiring that a right of way should be reserved in all patents for lands west of the one hundredth meridian for ditches and canals constructed by authority of the United States; section 18 of the act of March 3, 1891, granting a right of way through the public lands and reservations of the United States to canal or ditch companies, and the fourth section of the act of August 18, 1894, granting to each of the desert-land States lands that should be reclaimed by them to the amount of 1,000,000 acres each." Although several States have assumed the control of lands under the last named act little has been done as yet to introduce the water supply. The problem of irrigation, however, continues to receive careful attention.

During the year ending June 30, 1898, 1,625 mineral entries were made, a considerable increase over the previous year. The following table shows the number of mineral entries for each fiscal year, beginning with the year ending June 30, 1858:—

Year.	Mineral Entries.	Year.	Mineral Entries.	Year.	Mineral Entries.
1868	27	1878	642	1888	1,314
1869	52	1879	622	1889	1,304
1870	104	1880	772	1890	1,314

Year. Mineral Entries.		Year. Mineral Entries.		Year. Mineral Entries.	
1871	148	1881	1,338	1891	1,217
1872	264	1882	1,848	1892	1,330
1873	546	1883	2,112	1893	1,315
1874	587	1884	2,000	1894	868
1875	509	1885	1,588	1895	757
1876	583	1886	1,323	1896	1,199
1877	565	1887	1,325	1897	1,230
				1898	1,625

The grants of land made by Congress to aid in the construction of railroads during the fiscal year ending June 30, 1898, were 1,032,534.84 acres, a decrease of over 4,000,000, as compared with the year ending June 30, 1897. Readjustments of grants have been made in a good many instances, and it has been found in some cases that considerable tracts of land have been erroneously patented with the result that many suits for the recovery of title have been instituted. Considerable work was done in 1898 toward the restoration of lands thus illegally occupied. For a table giving further details in regard to the public lands of the United States, see the article UNITED STATES (paragraph Public Domain).

LATHOM, First Earl of, EDWARD BOOTLE-WILBRAHAM, G. C. B., died November 19, 1898. He was born in 1837; educated at Eton and at Christ Church, Oxford. He was Lord-in-Waiting to the Queen, 1866-68; Lord Chamberlain in 1885-92 and from 1895 to the time of his death. In 1882 he was one of the speakers of the House of Lords. He was an old and active member of the English Free Masons. He succeeded his grandfather as second Baron Skelmersdale in 1828 and was created Earl of Lathom in 1880.

LATHROP, GEORGE PARSONS, American essayist, novelist, poet, died in Roosevelt Hospital, New York City, April 19, 1898. Born in the Sandwich islands in 1851—his father being United States Consul there at the time—he came to America, was educated at Columbia University and in Dresden, Germany, and in 1871 married Rose, second daughter of Nathaniel Hawthorne. His experience both in newspaper writing and in legitimate literature was wide; he was an authority on American literary biography, a subject with which, aside from his own studies, he was made familiar by his long residence at the "Wayside," Hawthorne's old home in Concord, Massachusetts. Many of his sketches are bright and picturesque and some of his papers in criticism are of a high order. Although his chief talents did not lie in the line of novel writing, his stories are interesting and attained no small amount of popularity. Mr. Lathrop was an industrious worker and a man who was jealous of the dignity and welfare of his profession. He rendered much service in the organization of the Copyright League and in securing the passage of the Copyright Bill through Congress. An entertaining talker, a lover of the fine arts, a contributor to the best periodicals, a man who had occupied many important editorial positions, including the editorship of the *Boston Courier* and the assistant editorship of the *Atlantic*, Mr. Lathrop was considered one of the first American writers of his day. He was not great, but clever, not masterful, but charming. For some years preceding his death he lived in New York and New London. Among his more important works are: *A Study of Hawthorne*, *The Echo of Passion*, *Newport*, *In the Distance*, *Spanish Vistas*, *Rose and Roof-tree* (poems), *Keenan's Charge* (poems), *Somebody Else*, *True*, *Representative Poems*, *Dreams and a Day*, *Two Sides of a Story*, *Did He Kill Him?*

LATTER DAY SAINTS. See MORMONS.

LAUBIER, Rt. Hon. Sir WILFRED, D. C. L., G. C. M. G., LL. D., Premier of Canada, succeeding Sir Charles Tupper upon the latter's resignation in 1896, was born at St. Lin, Quebec, November 20, 1841. He was educated at L'Assomption College and received the degree B. C. L. from McGill University, 1864, and was admitted to the bar, becoming Queen's Counsel in 1890. Entered the Dominion Parliament in 1871 and was reelected, 1874; in 1877 he was Minister of Inland Revenue in the Mackenzie Ministry; the next year he was defeated at the general election, but was immediately elected for Quebec East; this same year he was reelected at the general election, and in 1882, 1887, and 1891. He was made leader of the Liberal party in 1891, and in 1896 became Premier, being the first French Canadian to hold that office. In 1898, he was appointed a member of the Anglo-American Joint High Commission. SEE CANADA (paragraphs on History).

LAVA. See GEOLOGY (paragraph Petrography).

LAWTON, HENRY W., Major-General, U. S. Volunteers, was in command of the second division of General Shafter's army (Fifth Army Corps), which captured El Caney, July 1, 1898. Born in Ohio in 1843, he entered the Union service, April 18, 1861, as first sergeant of Company E, Ninth Indiana volunteers, and served through the war. He was promoted repeatedly, received a medal of honor for gallantry be-

fore Atlanta, Georgia, on August 3, 1864, and on March 13, 1865, was brevetted colonel of volunteers, for gallant and meritorious service. A few months after he was mustered out he entered the regular army (July 1866) as second lieutenant of the Forty-first Infantry (colored); in January 1871, he was transferred to the Fourth Cavalry, with which he remained until the fall of 1888, when he was appointed inspector-general with the rank of major. He was subsequently advanced to the rank of lieutenant-colonel, and in May 1898, was made a major-general of volunteers. General Lawton has had much experience as an Indian fighter. For an account of the battle of El Caney, see SPANISH AMERICAN WAR (paragraph El Caney).

LEAGUE OF AMERICAN MUNICIPALITIES, established for the improvement of every branch of municipal administration. The league includes nearly every important city in the United States. The last assembly was held in Detroit; the one for 1899 will meet in Syracuse, N. Y. President, Samuel L. Black, Mayor of Columbus, O.; Secretary, B. F. Gilkison, Downing Building, New York.

LEBRUN-RENAULT, CAPTAIN, the French officer to whom Alfred Dreyfus was said to have confessed shortly before the public ceremony of degradation took place at the Ecole Militaire. According to this officer, Dreyfus said, "If I did deliver up documents to Germany, it was only in order to obtain more important ones in return." But Major Forzinetti said that Captain Lebrun-Renault himself told him that he had never received any confession from Captain Dreyfus.

LEAGUE OF AMERICAN WHEELMEN, organized in 1880 at Newport, R. I., to promote general interest in cycling, to ascertain, and defend the rights of wheelmen, to encourage the improvement of public highways, and to regulate all sports and races in which the wheel takes part. The membership equals 100,938. President, Isaac B. Potter; Secretary, Abbot Bassett, 72 Pearl street, Boston. Headquarters, 530 Atlantic ave., Boston.

LECITHIN IN PLANTS. Julius Stoklasa from an extended examination of lupines at the flowering time comes to the conclusion that lecithins and proteids are products of photosynthetic assimilation; the chloroplasts working with the energy derived from the sun's rays. The chlorophyll free cells of the fungi form their proteids and lecithins in some other way still little understood.

LEE, FITZHUGH, Major-General, U. S. Volunteers, was born at Clermont, Virginia, November 19, 1835. He is a nephew of Robert E. Lee; was graduated at West Point and commissioned a second lieutenant in the Second Cavalry in 1856, after which he served against the Indians and was severely wounded. He became instructor of cavalry at West Point in 1860, but the following year resigned and was commissioned first lieutenant in a corps of Confederate cavalry. He was prominent in all the campaigns in northern Virginia, including the battle of Winchester, where he was wounded and three horses were shot under him. In 1863 he rose to the rank of major-general, and in March 1865, was placed in command of the entire cavalry corps of the Army of Northern Virginia, but a month later surrendered to General Meade at Farmville. His fidelity to the Union was attested by his famous speech at Bunker Hill in 1874. In 1885 he defeated John A. Wise for the governorship of Virginia; was a delegate to the Democratic national convention in 1892, where he supported the nomination of Mr. Cleveland. In April 1895, he was appointed collector of internal revenue for the western district of Virginia, and in April of the following year the President appointed him to succeed Ramon O. Williams, resigned, as consul-general of Havana. During the trying months preceding the outbreak of the Spanish-American War General Lee performed his duties at Havana with the greatest efficiency. Late in the winter of 1898 the Madrid government expressed a wish that he be recalled, but disavowed its action in March. On April 5 General Lee was ordered to leave Havana; he was welcomed in the United States with expressions of the heartiest public approval. On May 4, President McKinley nominated him a major-general of volunteers and later in the month he was placed in command of the Seventh Corps. General Lee was appointed governor of the province of Havana and reached Cuba December 13, 1898.

LEE, Colonel HENRY, banker, died at Brookline, Massachusetts, November 24, 1898. He was born in Boston, September 2, 1817; was graduated at Harvard in 1836; and during the Civil War served on the staff of Governor Andrew. He was the author of *The Militia of the United States; What it is and What it Should Be*.

LEE, SIDNEY, author and editor, born in London, England, December 5, 1859. He was educated in London and Oxford, and since 1883 has been an editor of the *Dictionary of National Biography*. His publications include: Lord Berners's edition of *Huon de Bordeaux* (1883-5); *Stratford-on-Avon from the earliest times to the Death of Shakespeare* (1885, new ed., 1890); and *Life of Shakespeare* (1898).

LEEWARD ISLANDS, a British possession in the West Indies, south-east of Porto Rico, have a total area of 701 square miles and a population in 1891 of 127,723.

The islands include Dominica (area 291 square miles) Antigua (108) Virgin Islands, Montserrat, Barbuda, Redonda, St. Kitts, Nevis, Anguilla. About four-fifths of the population are negroes, the greater part of the remainder are mulattoes, while the whites number about 5,100. Among the products are sugar, coffee, cocoa, and fruits. There are private schools and schools receiving government aid. Religious denominations, in order of their size, are Anglicans, Wesleyans, Roman Catholics, and Moravians. For administrative purposes the group is divided into five presidencies. The Governor and Commander-in-Chief in 1898 was Sir Francis Fleming, K. C. M. G.

LE GALLIENNE, RICHARD, essayist, born in Liverpool, January 20, 1866. He was educated in Liverpool. He now lives in London. His books include: *My Ladies' Sonnets* (1887); *George Meridith* (1890); *The Book-Bills of Narcissus* (1891); *The Religion of a Literary Man* (1893); *Prose Fancies* (1894 and 1896); *The Quest of the Golden Girl* (1896); *If I were God* (1897); a verse translation of the *Rubaiyat of Omar Khayyam* (1898); and *The Romance of Zion Chapel* (1898). He lectured and read in America in 1898.

LEGION OF HONOR, instituted by Napoleon in May, 1802, as a reward for military and civil services. The constitution as remodeled by Napoleon III in 1852 now consists of grands croix, grands officiers, commandeurs, officiers, and chevaliers. The President of France is the Grand Master. In 1896, 49 grand croix; 210 grand officiers; 1,036 commandeurs; 5,667 officiers, and 36,052 chevaliers.

LEGION OF HONOR, AMERICAN, a fraternal and benevolent organization founded in 1878, has 9 grand councils, 550 sub-councils, and 20,345 members. Since its organization it has disbursed \$37,782,341 and \$1,983,500 during its last fiscal year. Supreme Commander, F. O. Downes, Boston; Supreme Secretary, Adam Warrnock, Boston.

LEHMANN, LILLI, opera singer, born in Würzburg in 1848. She was educated in singing by her mother, and by Sphor at Cassel, and made her *début* at Berlin in Meyerbeer's *Feldlager in Schlesien* in 1870. In 1876 she sang at the first Festival at Bayreuth the bird in *Siegfried* and one of the Rhine-Daughters. In 1884 she sang in London and later made her *début* in New York as Carmen, in the Metropolitan Opera House. In 1888 she was married to the tenor, Paul Kalisch. Mme. Lehmann is unsurpassed in her interpretation of Wagner. She was one of the Grau Company of 1898-99.

LEHMANN, LIZA (Mrs. Herbert Bedford), composer, born in London, England. She studied singing under her mother and Randegger, and composition under Raunkilde in Rome; Freudenberg in Wiesbaden, and Hamish MacCunn in London. Her first appearance was made in London in 1885, and on her marriage, in 1894, to Herbert Bedford, an English composer, she retired from the concert stage. She devotes herself to composition. Her great success was attained by her song-cycle for four solo voices *In a Persian Garden* (words from the Rubayat of Omar Khayyam), which was very popular throughout America in 1898. Her other works include: Scott's *Young Lochinvar*, for baritone solo, chorus, and orchestra; *Good Night Babette* and *Secrets of the Heart*, musical dialogues from Austin Dobson; and many songs.

LEIPSIK the principal city of Saxony in the German Empire with a population in 1895 of 399,963. It is the seat of one of the largest of the German universities: the University of Leipsic, which was attended in the summer of 1897 by 3,126 students, and it is famous as well for its fine libraries, and its notable architecture. An important educational event of the year 1898 was the establishment of a commercial high school, the first of its kind in Germany, with a course of study embracing the science of law, of political economy, commercial history, commercial geography, technology, foreign languages, commercial arithmetic, book-keeping, stenography, etc., the course covering a period of two years.

LEO XIII, POPE, celebrated on February 13, 1898, the sixtieth anniversary of his first mass. The anniversary of his coronation as Pope was celebrated on March 2, which was also his eighty-eighth birthday. In recent years the most important public statement of the Pope was his encyclical on labor, issued in 1891, in answer to a letter from Cardinal Gibbons on the subject of the Knights of Labor. His views in regard to Socialism are well-known. He has made many practical suggestions for the improvement of the laboring classes, but has opposed Socialistic schemes looking toward the establishment of a community of goods. The application of Christ's religion would, he thought, solve the labor problem. He has urged upon States the duty of forestalling of strikes by the enactment of proper laws. As to education, he has strenuously opposed the secularization of teaching, holding that when education is limited by law to purely secular matters it becomes in fact irreligious. As the

years of his pontificate have advanced the high opinion entertained of his enlightenment and Christian charity has been strengthened. For an account of his attitude toward the Manitoba School Question, see the article CANADA, and for a brief summary of the important encyclical relating to the status of the working classes issued in 1898, see the article ITALY (paragraphs on History).

LEOPARDI, GIACOMO, see ITALIAN LITERATURE (paragraph, Biography).

LEPIDODENDRON. See FOSSIL BOTANY.

LEPROSY. The annexation of the Hawaiian Islands by the United States brings this government face to face with the problem of caring for its new wards, the lepers, and maintaining an absolute quarantine against leprosy. The following facts regarding the leper colony are obtained from the report on leprosy in the Hawaiian Islands by Surgeon D. A. Carmichael of the U. S. Marine Hospital Service, November 29, 1898. Concerning the origin of leprosy in the islands there is much doubt. It is laid variously at the doors of the Chinese, the Maon branch of the Polynesians and the negro, black and white Portuguese and Chinese sailors of the North Pacific whalers. It probably existed in the islands in 1823, though certain authorities claim it first appeared between 1848 and 1858. Its spread has been restricted by the native government since 1865. In this year a hospital was organized and opened at Kalihikai on the island of Oahu, three miles from Honolulu, for the reception, inspection and treatment of lepers. Mild cases were retained here, and severe or incurable cases were sent to Kalawao on the island of Molokai. Of the 62 persons who presented themselves on the opening day, in obedience to the edict of Kamehameha, 43 were pronounced to be lepers. In 1866 the lepers on the different islands numbered as follows:

Hawaii	75
Mani, Molokai and Lanai.....	112
Oahu	80
Kauai and Niihau..	7
Total	274

The government supplies the lepers with the following weekly ration: Beef, 7 lbs.; salmon, 5 lbs.; fresh fish, 7 lbs.; pai-ai, or poi (a food prepared from the root of colocasia esculenta), 21 lbs.; rice, 9 lbs.; sugar, 3 lbs.; bread, 8½ lbs.; flour, 12 lbs. Children born at the settlement of leprous parents receive half this ration. Each leper receives in addition a clothes order worth \$5 every six months, and also monthly allowances of soap, salt, matches and kerosene oil. The cost to the government is about \$67,000 a year; and transportation of the lepers, together with the cost of segregation added to that of maintenance of the receiving station at Kalihi amounts annually to \$16,640. The settlement opened with 141 admissions, of whom 26 died the first year. In 1897 there were 124 admissions, 139 deaths, and on December 31, 1897 there were 1,100 on the books. For the two years from 1895 to 1897 there were examined 269 lepers, 72 suspicious persons, and 29 not lepers; of these 165 being males and 91 females. The ages ranged from 10 under 10 years, to 92 under 20 and over 10 years, 51 between 20 and 30 years. The nationalities were as follows: Hawaiians, 225; Half-caste, 15; Chinese, 9; Portuguese, 2; German, 2; American, 1; British, 1; and South Sea Islander, 1. Three escaped from Kalihi, three were sent to Japan, and seven were in Kalihi on December 31, 1897. The government maintains a home for leprous boys, a home for leprous girls and a home for non-leprous children of lepers. Inoculation of leprosy Carmichael considers possible, and states it as a fact that personal contact is a mode of communication, and a strong suspicion that the horse-fly, the mosquito and the bed bug are carriers of contagion. Alvarez, leprologist to the Hawaiian government, found bacilli of leprosy in the bodies of mosquitoes that had alighted on open sores of the lepers. Most of the white race seems to be immune to leprosy. White sailors very rarely contract the disease from leprous women, nor do women married to leprous husbands appear inevitably to catch leprosy. A census of the leper settlement on Molokai, taken November 11, 1898, was as follows: Leper males, 634; leper females, 439; total, 1,073; including boys, 141; girls, 130. Nonleprous children of leprous parents, male, 43; female, 18; total, 61. Helpers (Kokuas), nonleprous persons permitted by the board of health to live in the settlement and care for leprous relatives, etc., males, 37; females, 36; total, 73. Nonleprous priests, sisters, brothers, teachers, etc., 61. Grand total, 1,207. Heredity of leprosy is considered a mistake. Carmichael reports that a bouillon culture of the bacillus prodigiosus was used as an injection by Dr. Alvarez on 12 leper boys; after three months of which treatment two were declared cured. Stricter segregation should be demanded, in his opinion, intercourse between the unaffected and

the leprous should be prohibited, marriage of lepers should be prohibited, house-to-house inspection should be practiced, and leprous buildings and effects should be destroyed. He states the period of incubation of leprosy as from three to seven or ten years, the patches first appearing on the unexposed parts of the body, with ulcers in the upper part of the nasal passages, thus rendering detection by ordinary quarantine methods very difficult and uncertain. Carmichael mentions three forms of leprosy, the macular, the anaesthetic and the tubercular. By some the first two varieties are joined in one group, making but two forms. Some cases unite the features of all three varieties. The tubercular variety is characterized by a growth of granulation tissue in nodular form, or as a diffuse infiltration in skin and mucous membrane tissue. In the maculo-anaesthetic form the chief changes are in the nerves, leading to destruction of nerve fibres with consequent anaesthesia, paralysis of muscles and trophic disturbances.

Leprosy has a very wide geographical distribution, occurring in Norway, Russia, Greece and other European countries, and also in the Pacific Islands, in the warmer parts of North and South America, slightly in the northern part of North America, but chiefly and most commonly in Asia, being found in Syria, Persia, etc. The bacillus of leprosy was discovered by Hansen, of Bergen, Norway, in 1871. Neisser, in 1879, after extended researches confirmed Hansen's claims. The bacillus is a straight or slightly curved thin rod, non-motile, occurring singly or in pairs attached end to end, but never in chains. When stained it appears much like the bacillus of tuberculosis, but often takes stain in such a way as to suggest that the protoplasm is fragmented, the bacilli then appearing like cocci in short rows, darkly stained points alternating with unstained points. The bacilli appear in very large numbers in the leprous tissue, especially in the tubercular form, lying in bundles of several bacilli arranged parallel to each other, the bundles lying in various directions. But one successful attempt to cultivate leprosy bacilli in animals has been reported. Melcher and Orthmann some years ago inoculated the anterior chamber of the eye of rabbits with leprous material, and the experiment was followed by an extensive growth of nodules containing leprosy bacilli in the lungs and internal organs.

LIBERIA, the sole independent negro state in Africa, lies on the west coast of that continent between the fifth and eighth degrees of north latitude, with an area placed by some at 14,360 square miles and a total population estimated at 1,068,000 including 18,000 Americo-Liberians. Dr. J. C. Hartzell, the missionary bishop of Africa, however, writing in 1898 estimated the area at 75,000 square miles and the Americo-Liberian population at 24,000. Liberia has a coast line of about 300 miles and extends about 250 miles into the interior. The growth of the republic has been slow owing in part to the lack of money. Its territories have not even been fully explored and trade is still in its infancy. The capital is Monrovia with an estimated population in 1897 of 5,000. The products and principal exports are coffee, palm oil, palm kernels, rubber, cocoa, sugar, arrow root, ivory, and hides. The revenue is derived mainly from customs duties. The form of government is modelled on that of the United States, having a President elected for two years, a House of Representatives elected for the same period, and a Senate elected for four years. In 1898 the President was W. D. Coleman who assumed office on November 13, 1896. The colony has been in existence about seventy-five years, having owed its origin to the American Colonization Society and similar organizations which were started for the purpose of aiding the negroes to emigrate from the United States and found a colony in Africa which should serve both as a refuge for negroes from other lands and as a means of civilizing the African continent. For the first twenty-five years of its history Liberia was administered by the colonization societies, but in 1847 it took its place among independent nations. In its development it has had to contend with an unfavorable climate and inadequate resources. The poverty and inexperience of the settlers have made it lag behind many of the other colonies of Africa and it has been the subject of much harsh criticism. Neither its mineral nor its agricultural resources have been developed. During the last few years the republic has received outside aid from the governments of other states and has made considerable advance. A few thousands of the natives have become civilized but still the great majority of the inhabitants are heathens and barbarians. Its territories have been eagerly desired by Germany and France. The latter power has acquired by treaty a right to reassert its claim for certain territories on the coast and for the hinterland down to some forty miles from the sea in case any part of the republic's land is alienated. The boundaries between its domains and those of France were fixed by a convention at the end of the year 1892 by which France secured the Rio Cavally as its frontier, thus gaining control of the coast line between this river and San Pedro. There has recently been some discussion in regard to a German protectorate, arising from disputes between Germany and Liberia, but Liberia has naturally turned for protection to the United States or to England since the language spoken by the civilized portion of the inhabitants is

English. Under the protection of one or the other of these powers it is thought by some that the advancement of the little republic would certainly result. It would be enabled thereby to secure a further influence over the natives and to push on works of improvement, especially the opening of lines of communication by means of telegraphs and railways.

LIBRARY ASSOCIATION, AMERICAN, a national body organized in 1876 and incorporated in 1879, seeks to strengthen the public library in every way as a part of the American educational system. Its membership exceeds 800. The next and 21st general meeting will be held in Atlanta, Ga., in May, 1899. President, William C. Lane, Librarian of Harvard, Cambridge; Secretary, Henry J. Carr, Scranton, Pa.

LIDDELL, Very Reverend HENRY GEORGE, D. D., scholar and Greek lexicographer, died January 19, 1898. Born in England in 1811, he was graduated from Christ Church, Oxford, with a "double first" in 1833; he then became tutor and censor in his *alma mater*, public examiner in classics, select preacher, and proctor. He left Oxford to become headmaster of Westminster, which at that time was perhaps the most important classical school in England; upon the death of Dean Gaisford, Liddell accepted the deanship of Christ Church and returned to Oxford. He was a member of the Oxford University Commission (1850), domestic chaplain to Prince Albert, Chaplain Extraordinary to the Queen, and in 1870 became the Vice-Chancellor of his University. He retired from office in 1891. He is known to the public chiefly through his *History of Rome* (1855), and his great Greek lexicon, which he compiled in collaboration with Dr. Robert Scott, of Balliol, and the first edition of which appeared in 1843, and the last, the seventh, greatly augmented and improved, in 1883. For sixty years the influence of Dr. Liddell was very strong at Oxford, his power being felt in every department, in both those of learning and of administration.

LIEZEN-MAYER, ALEXANDRE VON, Hungarian historical and portrait painter, died in Munich, February 19, 1898. He was born at Raab, January 24, 1839; studied at the academies of Vienna and Munich and at Piloty's studio in the latter city. His first real success came in 1867 when he exhibited "Maria Theresa Nursing a Poor Child." After making illustrations for the works of Goethe and Schiller he went (1870) to Vienna and painted a portrait of the Emperor. Returning to Munich he made illustrations for *Faust*, *Scheffel's Ekkehard*, and *Schiller's Lay of the Bell*, and painted scenes from *Faust*, and *Cymbeline*. In 1880 he was appointed director of the Stuttgart Art School and three years later became professor at the Munich Academy. His works include: "The Coronation of Charles of Durazzo," 1862; "Canonization of Elizabeth of Thuringia," 1867; "Faust and Margaret"; "Imogen and Iachimo"; "Elizabeth Signing Mary Stuart's Death Warrant," 1875; "Irmgard and Imgo," 1877; "Portrait of Emperor Franz Josef;" "Chorus of Nereids," 1880; "First Love," 1884.

LIFE SAVING SERVICE. On June 30, 1898, there were connected with the U. S. Life Saving Service 192 stations on the Atlantic coast, 15 on the Pacific, 56 on the lakes and 1 at the Falls of the Ohio, Louisville, Ky. For the fiscal year ending as above there were 402 disasters of moment, involving \$7,168,000 worth of property and 3,113 lives. Of these totals, \$758,000 of property and 12 lives were lost. In minor casualties, 10 lives were lost. The cost of the service for the year was \$1,498,000. The Volunteer Life Saving Corps of the State of New York, "Inland Waters," has 670 stations and 6,000 enrolled members. It has saved 1,584 lives in five years. Its secretary is Thos. Smith, 63 Park Row, New York City.

LIFT LOCKS. See CANALS (paragraph Lift Locks).

LIMES. See ARCHÆOLOGY (paragraphs Switzerland and Germany).

LIMESTONE. See BUILDING STONES.

LIMONITE. See IRON ORES.

LINTON, ELIZABETH LYNN (Mrs.), English novelist and essayist, died July 14, 1898. She was the youngest child of the Rev. James Lynn, Vicar of Crosthwaite, and was born February 10, 1822; was educated at home; married in 1858 William James Linton, the engraver on wood, who died December 29, 1897. Her independent career as a writer began in 1845, when she went to London, where she lived for fifty years. She was opposed to what is known as the movements for the "emancipation of women." Mrs. Linton was the author of numerous essays and short stories not as yet collected. Among her other publications are: *Azeth the Egyptian*; *Amymone, A Romance of the Days of Pericles*; *Lizzie Lorton of Greyrigg*; *Sowing the Wind*; *Grasp your Nettle*; *Patricia Kemball*; *the True History of Joshua Davidson*; *Leam Dundas*; *My Love*; *Under which Lord?*; *Ione Stewart*; *Paston Carew*; *The World Well Lost*; *Through the Long Night*; *The Autobiography of Christopher Kirkland*; *In Haste and at Leisure*; *Dulcie Everton*; *The Mad Willoughbys*; *The Girl of the Period* (1883); *An Octave of Friends* (1891); *Christian and Communist*; *The One Too Many* (1894).

LINTON, WILLIAM JAMES, M. A., wood engraver and author, died in New Haven, Connecticut, December 29, 1897. He was born in London, England, in 1812; was apprenticed in 1828 to G. W. Bonner and in 1842 became the partner of Arrin Smith, a well known wood engraver. In early life—in the forties—he was an enthusiastic Chartist leader, giving aid to republican movements both in England and on the continent. He was one of the founders of the *Leader*, editor of *Pen and Pencil* (1855), contributed to many of the best magazines, and became a superior engraver on wood. Among his works, which number about fifty, are *The History of Wood Engraving*; *The Work of Deceased British Artists*; several volumes of *The English Republic*; *The Masters of Wood Engraving* (published in 1890, and an authoritative work); *Claribel and Other Poems*, etc. He came to the United States to reside in 1867, and in 1891 received the degree of M. A. from Yale.

LINTNER, JOSEPH ALBERT, Ph. D., entomologist, died in Rome, Italy, May 5, 1898. He was born at Schoharie, New York, February 8, 1822, being of German extraction. Upon his graduation from the Schoharie Academy in 1837, he went to New York City, and, although he had a liking for literary and scientific research and devoted much of his time thereto, he entered the mercantile business, and, returning to his native town in 1848, engaged there in the same pursuit. About this time he took up the study of entomology, and, though engaged in woolen manufacture at Utica in 1860-67, he became in 1868 zoological assistant in the New York State Museum of Natural History, at Albany. He remained in this position for twelve years, devoting his attention to entomological research, and a number of papers, prepared by him and published in reports and elsewhere, showed that he recognized the importance of the study of entomology in its relation to agriculture and horticulture. In 1880 Professor Lintner was appointed by Governor Cornell to be State Entomologist and the following year he was reappointed under an act of the legislature establishing the office, defining its duties, and naming its salary. The appointment was urged by many of the prominent scientific men of the country, and was always regarded as most excellent. From 1880 until the time of his death Professor Lintner continued in charge of the department, and not only became well known throughout the country by his scientific investigations, but in his official career met the wishes of his warmest advocates for the position. His collection of insects was remarkable for its size and completeness. His publications, especially in economic entomology, were voluminous, and their value is attested by their having been extensively copied in both American and foreign scientific journals. For two years he was president of the Entomological Club of the Association for the Advancement of Science and for many years was president of the department of natural science in the Albany Institute, and was also a member of some twenty scientific societies, both at home and abroad. Under the act of 1883 reorganizing the State Museum of Natural History Professor Lintner was made one of the scientific staff of that institution, which publishes the reports of his department. The degree of Doctor of Philosophy was conferred upon him by the Regents of the University of the State of New York, July 1884. His scientific papers down to July 1887, number 413. Officially he has published *Report on the Injurious and Other Insects of the State of New York* (2 vols. 1883-5); also *Report of the State Entomologist* (1883 et seq.).

LIQUEFACTION OF GASES. See LIQUID AIR and PHYSICS (paragraphs Liquid Air, and Liquefaction of Hydrogen).

LIQUID AIR AND OXYGEN. Although the liquefaction of gases is by no means new, considerable popular attention has been attracted to the subject in America by the experiments of Mr. Chas. E. Tripler, of New York City, and abroad by the experiments of Dewar, Fleming, Hampson and Linde.

History.—Without attempting to go into details it will suffice to say that the liquefaction of the so-called permanent gases was first accomplished by Northmore in 1806, who succeeded in obtaining liquid chlorine by pressure. Faraday followed, liquefying ammonia, hydrochloric acid and nitrous oxide, by means of strong bent glass tubes into which was sealed suitable materials for producing the gas desired. Heat was applied at one end of these tubes and cooling mixtures at the other. The pressure and cold thus obtained produced the liquid gas. Two factors are necessary to liquefy a gas, pressure and cold. Every gas, so far as now known will liquefy under a given pressure provided it is cooled to a certain temperature known as its "critical temperature." The name critical is given to the temperature and also to the pressure at which a gas liquefies. Some gases are easily liquefied because they have easily attained critical temperature and pressure, for instance sulphur dioxide, which when under a pressure of 1.53 atmosphere will turn to a liquid if cooled to 0° centigrade. At atmospheric pressure a temperature of -10° centigrade is necessary. In 1833 liquid carbonic oxide was produced and Faraday continued his experiments reaching the extremely low temperature of -110° centigrade, using the bent tube method previously mentioned. He could not however liquefy some of the important gases, namely, oxygen, nitrogen, and hydrogen. A number of Faraday's tubes containing liquid gases are preserved at the museum of the Royal Institution in London.

In 1877 two French experimenters, Pictet and Cailletet working separately and along different lines succeeded in liquefying oxygen. The former employed an apparatus in which two powerful pumps compressed sulphur dioxide gas, and carbon dioxide to a liquid. The sulphur dioxide was used to cool the carbon dioxide, a temperature of -65° centigrade being attained. This cold carbon dioxide was then rapidly evaporated producing a temperature of -130° centigrade. When this intensely cold vapor was caused to surround a copper coil containing oxygen under pressure, a portion of the oxygen immediately liquefied. The second experimenter, Cailletet, employed a hydraulic press capable of producing pressures as high as 1,000 atmospheres (15,000 lbs. per sq. in.). Oxygen under this pressure was allowed to escape and the resulting rapid expansion lowered the temperature of the escaping gas to such a degree that a portion of it liquefied. This principle is employed in all recent apparatus for the liquefaction of gases.

In 1883 two Russian physicists, Wroblewski and Olszewski produced liquid oxygen in a form of apparatus employing the boiling or rapid evaporation of liquid ethylene. Their experiments were very complete. Among other surprising results they succeeded in freezing alcohol, the temperature being -130.5° C. while sulphur dioxide solidified at -116° C. In 1884 they produced 6 cubic centimeters of liquid air. It was not until 1890 that liquid air and oxygen were produced in any quantity. In this year Prof. Dewar of the Royal Institution, London, England, constructed an apparatus employing the principle of Pictet with which he produced liquid air and oxygen in quantities sufficient to conduct a long series of experiments relative to the strength of materials under such extremely low temperature, and together with Prof. Fleming the resistance of various metals usually employed in electrical work. It is asserted that the output of this equipment which included a large gas engine, several powerful pumps and about 100 lbs. of liquid ethylene would produce a litre of liquid air in two hours.

Tripler's Apparatus.—About the same time Mr. Chas. E. Tripler of New York City after several years experimenting developed a form of apparatus which may be said to be a practical machine. He constructed larger and more improved forms until at the present time he has in his laboratory in New York City a plant for manufacturing liquid air, which has a capacity of about 40 gallons per day of ten hours. In this

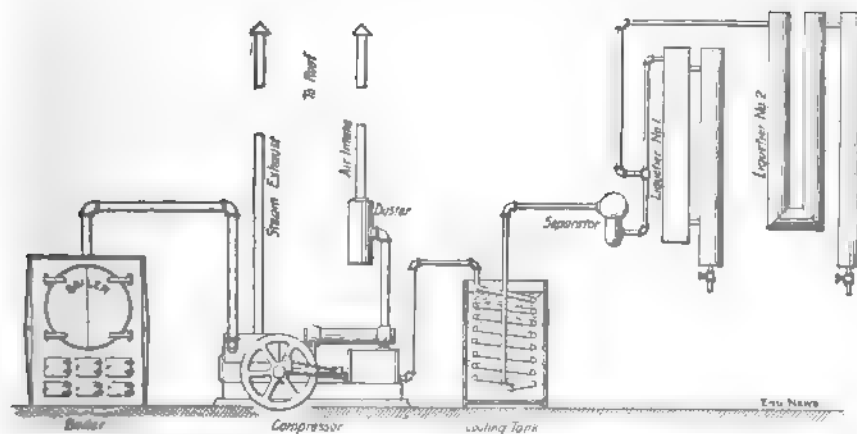
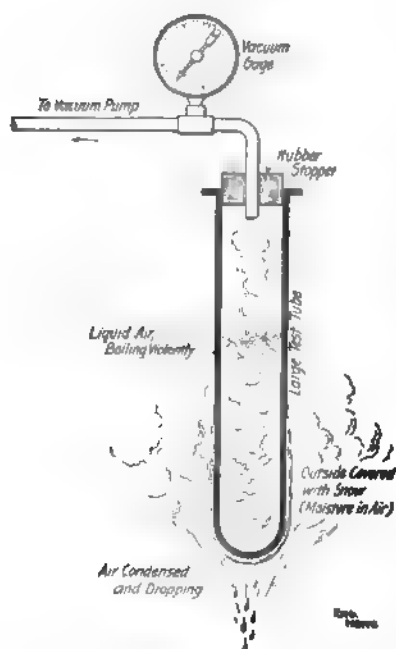


Diagram of Apparatus used by Mr. Chas. E. Tripler to Liquefy Air.

plant there is a Norwalk straight line air compressor with a 16x16 in. steam cylinder using steam at about 85 lbs. pressure and three air cylinders the diameters being $10\frac{1}{2}$ inches, $6\frac{1}{4}$ inches and $2\frac{3}{4}$ inches. Air is drawn from the outside through a dust remover to the first cylinder and compressed to between 55 and 65 lbs. per sq. in. gage pressure, it is then passed to the intermediate cylinder and compressed to between 350 and 400 lbs. The last compression raises the pressure to from 2,000 to 2,500 lbs. per sq. in. The heat caused by compression is removed by "intercoolers" through which the air passes after each compression. The last cooler is a large tank filled with running water in which the air pipe is coiled. The air is now passed through a "separator" which removes all moisture, and then enters the "liquefier" which is nothing more or less than a coil of small pipe of many turns, the whole surrounded by a casing which is insulated from external heat by a heavy packing of felt. At the lower end of this coil tube is an expansion valve which permits the cool air at 2,200 lbs. to expand to a little above atmospheric pressure into the space between and around the coiled pipe. A slight fall of temperature results and the expanded air now a trifle

colder passes on and up coming in contact with the coiled air pipe and absorbs some of the heat contained in the air in the pipe. This cooler air reaches the nozzle and expands, becoming slightly colder, only to pass out of the apparatus cooling the entering air below its original temperature. This accumulative process continues until the "critical temperature" of air (-220°C.) is reached when a portion of the expanding air liquefies and falls into a receptacle at the bottom of the apparatus from which it can be drawn at will. (See PHYSICS.) Apparently the discovery of this process is claimed by several persons besides Mr. Tripler, principally by Mr. W. Hampson in England and Dr. Carl Linde of Munich, Germany. However that may be it is a fact that Mr. Tripler experimented on a large scale and produced results of remarkable importance and is hence entitled to a fair share of credit even if patents are not sustained. The air as it issues from the spigot of the apparatus resembles vichy coming from a siphon. In an unprotected vessel it is constantly boiling more or less violently and it can only be seen in a quiescent and true state by filtering it into a double vessel consisting of an inner and outer casing, the space between which is a vacuum. In this condition it has a clear transparent appearance resembling water, except that it has a tinge of cobalt blue. Its temperature is -312°F. or about -344°F. below the freezing point of water.



Condensing the Ordinary Air surrounding a Test Tube.

tion, employs practically the same apparatus or method of accumulative cooling except that instead of exhausting the expanded air into the atmosphere he employs a closed system; the exhausted air feeding back to the compressor. The highest pressure is 200 atmospheres (about 3,000 lbs.) from which the air expands through a nozzle of special design to 16 atmospheres (about 250 lbs.) and passes back to the compressor through a large tube surrounding a smaller one in which is the incoming air under high pressure. The third claimant Mr. W. Hampson of England, has constructed a small machine capable of producing 12 litres of liquid air per hour, employing $3\frac{1}{2}$ indicated horse power and a pressure of 120 atmospheres. The time required before the first liquid appears is stated as 16 minutes. His apparatus is much the same as Mr. Tripler's and like it exhausts into the air. (See PHYSICS.) The following table (Table I) affords a comparative idea of the dimensions of the three important machines so briefly described:

TABLE I.

	Tripler.	Linde.	Hampson.
Weight of Coil.....	15	132 lbs.	14½ lbs.
Time to liquefy air.....	4 Gal.	2 hours.	16 min.
Quantity of liquid air per hour.....	12 per cent.)?	0.9 litres.	1.2 litres.
Air compressed per hour.....	146 Atms.	22 cubic metres.	13½ cu. metres.
Liquefied.....		8.5 per cent.	6.6 per cent.
Compression of air.....		190 atms.	120 atms.
Time for liquefaction with 130 atms.....			10 min.
Preliminary refrigeration removing moisture.....		(-20°C.) ice and salt.	($+20^{\circ}\text{C.}$) none used.
Means of clearing liquid of impurities.....	Filtration.	Filtration.	none required.
Time for liquefaction with preliminary cooling with carbolic acid.....			
Liquid oxygen from 1 cylinder of oxygen at 120 atmospheres after using carbolic acid.....		Nearly 1 hour.	1 min.
Size and portability.....	Not portable.	Not obtainable.	150 cu. cm.
Convenience in working.....	Large plant.	Stands on 3 feet square heavy.	Stands on 1 foot square of easily carried.
H. P. hours used from start to produce 0.75 litre of liquid air.....	4.5 H. P. plant produces 4 gal. per hour.	3 gages 3 valves.	1 gage 1 valve.

Properties of Liquid Gases.—Regarding the properties of liquid air and other gases, little is definitely known. The following comparative table gives approximate values for the different quantities given in the headings. It is taken from data originally prepared by Olszewski:

TABLE II

GAS.	Critical Temp. C. degrees.	Critical Pres. Atms.	Boiling Point Degrees C.	Freezing Point.	Freezing Pres. Min.	Density of gas.	Density of liquid at boiling Point.	Color.
Hydrogen.....	Below —220	20	?	?	?	1	?	Colorless
Nitrogen.....	—146	85	—194.4	—214	—80	14	0.885	"
Carbonic Oxide.....	—189.5	85.5	—190	—207	—100	14	?	"
Argon.....	—121	50.6	—186.9	—189.6	?	19.6	1.5	"
Oxygen.....	—118.8	50.8	—183.7	?	?	16	1.124	Bluish.
Nitrogen Monoxide	—98.5	71.4	—153.6	—167	—138	15	?	Colorless
Methane.....	—81.8	54.9	—164	—185.8	—80	8	0.415	"

If liquid air is allowed to stand for some time, the contained nitrogen evaporates, the carbonic acid is precipitated as a whitish powder and the oxygen is left in a nearly pure state. The rate of this evaporation is shown by the following table:

TABLE III

Percentage of liquid air not yet evaporated.	Percentage of oxygen in liquid.	Percentage of oxygen vapor coming off.	Percentage of original oxygen still in liquid.
100	23.1	7.5	100
50	37.5	15	80
30	50	23	65
20	60	34	52
15	67.5	42	43
10	77	52	33
5	88	70	19

The latent heat of vaporization and specific heat of liquid air are not known definitely, but probably are somewhere near these values for oxygen. The latent heat of vaporization of oxygen is 80 calories, and its specific heat 0.39 between —198 and —182. Its internal capacity is more than likely very close to 1, using chloroform as the standard. Liquid air is transparent to both heat and light, this is shown by passing a beam from an arc light through a vessel containing liquid air which will when focused ignite paper. The approximate heat transmitting properties of several of the liquid gases is as follows:

Chloroform	1.
Carbon disulphide.....	1.6
Liquid oxygen.....	0.9
Liquid nitrous oxide.....	0.93
Liquid ethylene.....	0.60
Ether	0.50

Effects of Liquid Gases.—The effects of the intense cold which can be produced by evaporating liquid air, oxygen or hydrogen are almost beyond comprehension, practically all plastic or soft materials when immersed become hard and brittle, leather being one exception; some metals become brittle and can be broken or crumbled; alcohol may be frozen and air and oxygen themselves solidify if placed in liquid hydrogen. Vegetable and animal matters putrefy readily after being subjected to temperatures as low as —312 F. the freezing apparently having no effect upon subsequent decay if unsterilized. Certain bodies not ordinarily exhibiting fluorescence have this property when reduced to these low temperatures. Colored salts are often deprived of color. Liquid oxygen is strongly magnetic having a magnetic moment, when compared with iron as 1 to 1,000; liquid air is also magnetic.

The effect of the extreme cold obtained by the use of liquid air upon the metals was investigated by Prof. Dewar who is the author of the following table:

TABLE IV.

Breaking stress in lbs. (tension). Metallic wires 0.098 ins. in diameter. at 15° C. at —182° C.		
Soft steel.....	420	700
Iron ..●.....	320	670
Copper	200	300
Brass	310	440
German Silver.....	470	600
Gold	255	340
Silver	330	420

Breaking stress in lbs. Cast metallic test piece 0.2 ins. in diameter. at 15° C. at —182° C.		
Tin	200	390
Lead	77	170
Zinc	35	26
Mercury	0	31
Bismuth	60	30
Antimony	61	30
Solder	300	645
Fusible metals.....	140	450

The specific resistance of metals commonly used as conductors for electric currents decreases as the temperature is reduced. An exhaustive investigation made by Profs. Dewar and Fleming indicates that the resistance of all pure metals becomes nothing when the absolute zero is reached; the metals then becoming perfect electric conductors. This is not entirely true with alloys and metals containing impurities. These effects are all temporary. Liquid air since it contains such a large percentage of oxygen will support combustion and a red hot piece of steel or carbon, will burn brightly when thrust into air which has been standing a short time.

Uses of Liquid Air.—Hitherto liquid air has not been a commercial success owing to the expense of production and difficulty of keeping it in a liquid form, the temperature of surrounding objects being greater in comparison with the liquid air than the temperature of ice compared with boiling water. The possibilities of liquid air are many. It can be used for refrigeration, being carried about in wagons and left at residences like ice is now; motor vehicles and launches can be operated by it; surgeons can use it in operations, and for ventilating and cooling living rooms, halls, etc., it would be invaluable. More remote possibilities are the operation of submarine boats, torpedo boats, and even large vessels and possibly flying machines.

Comparative Energy.—A comparison of the approximate amount of energy stored in a pound of various materials is shown in the following table:

Material.	Heat energy per lb. in B. T. U.	Foot lb. per lb. of materials.
Natural gas.....	24,000	2,800.800*
Illuminating gas.....	22,600	2,637.300*
Petroleum	20,000	2,334.000*
Water gas.....	7,061	823.900*
Producer gas (Bit).....	2,380	277.600*
Produce gas (amth).....	2,100	244.950*
Anthracite coal	12,500	972.500†
Bituminous coal.....	8,000	622.400
	to 14,500	to 1,128.100†
Water 400 lbs. pressure at 445° F.....		43.000‡
Storage Battery.....	8,500 to 15,000	
Liquid Air.....		139,100

One B. T. U. is the amount of heat required to raise one pound of water 1 degree F. The foot-pound is the work expended in raising one pound 1 foot high in any time.

* If used in a gas engine of 15 per cent. efficiency.
† If used in a steam engine of 10 per cent. efficiency.
‡ If 20 per cent. of its heat is transformed to power. See also the articles PHYSICS, KRYPTON, METARGON, NEON and XENON.

LIQUORS, WINES AND BEER. The production and consumption of alcoholic beverages in the United States, the United Kingdom, France and Germany for the years 1895, 1896 was as follows:

WINE

YEARS.	UNITED KINGDOM.		FRANCE.		GERMANY.		UNITED STATES.	
	Consumption.	Per head of the population.	Consumption.	Per head of the population.	Consumption.	Per head of the population.	Consumption.	Per head of the population.
1895	Gals. 14,553,000	Gals. 0.87	Gals. 940,368,000	Gals. 24.48	Gals. 55,195,000	Gals. 1.08	Gals. 16,868,000	Gals. 0.28
1896	15,778,000	0.40	1,187,224,000	29.50	.....	.....	15,578,000	0.28

BEER.

1895	1,100,127,000	89.6	196,548,000	5.1	1,215,978,000	36.5	889,082,000	12.4
1896	1,211,539,000	80.7	199,122,000	5.3	1,333,090,000	35.5	900,161,000	12.7

SPIRITS.*

1895	29,063,000	1.00	68,156,000	1.78	97,746,000	1.29	64,891,000	0.9
1896	40,076,000	1.01	70,180,000	1.85	100,760,000	1.94	69,186,000	0.8

* Proof gallons containing 50 per cent. of alcohol.

Moniteur Vinicole gives the World's wine production by countries, as follows:

COUNTRIES.	1895.	1896.	1894.
	Gallons.	Gallons.	Gallons.
France	1,178,924,000	704,833,000	850,100,000
Algeria	109,830,000	100,269,000	80,124,000
Tunisia	2,513,000	4,747,000	4,936,000
Italy	559,327,000	640,000,000	570,000,000
Spain	479,712,000	597,310,000	628,000,000
Portugal	86,992,000	62,008,000	33,000,000
Azores, Canaries, Madeira	8,448,000	5,544,000	2,641,000
Austria	86,000,000	79,200,000	68,000,000
Hungary	43,720,000	75,695,000	46,103,000
Germany	82,104,000	96,238,000	110,000,000
Russia	70,500,000	10,000,000	7,000,000
Switzerland	30,000,000	30,000,000	29,000,000
Turkey and Cyprus	80,120,000	63,300,000	20,000,000
Greece	56,790,000	42,240,000	28,000,000
Bulgaria	85,000,000	31,000,000	31,000,000
Serbia	29,040,000	21,120,000	30,000,000
Roumania	198,000,000	82,368,000	24,200,000
United States	17,062,000	22,440,000	20,000,000
Mexico	1,848,000	2,376,000	.....
Argentina	41,976,000	35,000,000	26,400,000
Chile	45,672,000	39,000,000	19,800,000
Brazil	12,540,000	9,500,000	8,800,000
Cape Colony	2,876,000	2,004,000	2,024,000
Persia	844,800	512,800	628,000
Australia	4,754,000	3,080,000	2,640,000

The total production of spirits in the United States for the years ending June 30, 1890 to 1897 inclusive, is given by the Internal Revenue Department as:

Year ending June 30.	Ferment'd Liquors.	Bourbon Whiskey.	Rye Whiskey.	Alcohol.	Cologne Spirits.	Fruit Brandy.	Total Distilled Spirits.
	Barrels.*	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
1870.....	6,724,817	17,414,148	17,461,001	20,681,000	20,687,775	1,225,820	78,500,860
1871.....	12,744,111	17,414,148	17,461,001	11,774,448	24,827,419	1,225,820	91,876,417
1872.....	27,494,944	17,414,148	17,461,001	11,774,448	24,827,419	1,225,820	111,301,338
1873.....	31,497,309	17,414,148	17,461,001	12,294,821	26,179,138	1,225,820	117,767,040
1874.....	31,497,309	17,414,148	17,461,001	14,449,377	27,044,886	1,225,820	118,436,540
1875.....	34,497,779	17,414,148	17,461,001	15,774,800	27,577,568	1,225,820	121,000,280
1876.....	34,497,779	17,414,148	17,461,001	16,777,370	28,044,113	1,225,820	122,180,801
1877.....	34,497,779	17,414,148	17,461,001	17,777,370	28,044,113	1,225,820	123,000,771
1878.....	34,497,779	17,414,148	17,461,001	17,777,370	28,044,113	1,225,820	123,000,771
1879.....	34,497,779	17,414,148	17,461,001	17,777,370	28,044,113	1,225,820	123,000,771

* Holding not more than 21 gallons.

LITERATURE, ENGLISH AND AMERICAN. 1. *England.*—In nothing is the close kinship between England and the United States more keenly felt than in the interchange of books, and, generally speaking, what is successful in one country proves equally popular in the other. Many examples might be cited but we shall select only one—*The Day's Work*, by Kipling, which has taken the lead of all books in fiction. During the year the South African market grew into great importance, just as that of Cuba and Porto Rico will doubtless become to the American trade. Early in the year the books that had the largest sales were: W. H. Fitchett's *Deeds That Won the Empire*, Kipling's *Captains Courageous*; Hall Caine's *The Christian*, H. S. Merriman's *In Kedar's Tents*; R. Marsh's *The Beetle*; M. E. Coleridge's *The King With the Two Faces*, E. L. Voynich's *The Gadfly*; Mary E. Wilkins's *Jerome*, J. M. Barrie's *The Little Minister*; C. T. Meade's *Under the Dragon Throne*, Lewis Carroll's *Works*; Stephen Phillips's *Poems*; Prince Ranjitsinhji's *Book of Cricket*, Mrs. Bishop's *Korea*; and R. Waliszewski's *Peter the Great*.

Sandow's book on *Strength* met with a large sale, as did Fairy-tales, Blackie's six shilling books for boys and the six shilling novels. Towards the spring Anthony Hope's *Simon Dale*, and Dr. S. Weir Mitchell's *Hugh Wynne*, Stanley J. Weyman's *Shrewsbury*, H. G. Wells's *War of the Worlds*, and D'Annunzio's *Triumph of Death* were among the most called-for novels. Books on Cuba and the Cubans were also in demand. Gertrude Atherton's *American Wives and English Husbands* also attracted attention, and books dealing with the Frontier War in India. On the death of Gladstone not only biographies of the great statesman, but his writings were sought, especially his *Impregnable Rock of Scripture*. The Wagner cycle in June made several books on the Wagner question popular, notably Freda Winworth's *The Epic of Sounds*. In the summer books on athletics and out-door pleasures sold largely, the first number of the *Harmsworth Magazine* appeared, and Maurice Hewlett sprang into immediate favor with his *Forest-Lovers*. The interest in Bismarck's biographies lasted only a few days. Ellen T. Fowler also achieved a reputation with *Concerning Isabel Carnaby*. George Moore's *Evelyn Innes* was also purchased in large numbers, while Anthony Hope's *Rupert of Hentzau* had a long continued vogue. Lord Robert's *Forty-one Years in India*, Burleigh's *Sirdar and Khalifa*, and *Fire and Sword in the Soudan*, by Slatin Pasha sold freely. The sales of the *Harmsworth* and the *Wide Wide World* Magazines were so phenomenal as to create much comment. In the early autumn interest in books on the Soudan and affairs of the English nation found a parallel to the interest in this country in Cuba and Porto Rico and national questions. Steeven's *With Kitchener to Khartoum* was in the lead. Lack of interest in theological and religious books was very noticeable throughout the year. Meyer's *Practical Dictionary of Cooking* sold well. The favorite juveniles were fairy-tales and books of adventure in the Christmas season of 1898, as in the season of 1897, proving that the taste of the young is not fickle.

The London *Publisher's Circular* gives the following book statistics for 1898:

	New Books.	New Editions.
Fiction and Juvenile works.....	1,748	644
Poetry and Drama.....	200	81
Arts, Sciences and Illustrated works.....	263	12
Educational, Classical and Philological.....	732	180
Theology and Religion.....	535	131
Political and Social Economy.....	437	97

	New Books.	New Editions.
Law and Jurisprudence	117	46
Voyages, Travels, Geographical Research.....	133	39
History, Biography, etc.....	618	225
Medicine, Surgery, etc.....	160	36
Belles-Lettres, Essays, etc.....	182	36
Miscellaneous, including pamphlets.....	436	30
	6,008	1,508
		6,008
		7,506
The total output of 1897 was.....		7,926

Many of the books in the following list bear the date of 1897 as the English year is from November to November. Those marked with an asterisk were also popular in America. First we may mention that the London Academy crowned with fifty guineas each—Maurice Hewlett's *The Forest-Lovers*, Joseph Conrad's *Tales of Unrest*, and Sidney Lee's *Biography of Shakespeare*.

Fiction.—Theodore Watts-Dunton's long expected novel *Aylwin*;* Rudyard Kipling's *The Day's Work*;* Maurice Hewlett's *The Forest-Lovers*;* Mrs. Humphrey Ward's *Helbeck of Bannisdale*, a tragic novel dealing with religion and passion; Anthony Hope's *Simon Dale*,* introducing Charles II and Nell Gwynn, and *Rupert of Hentzau*,* a sequel to the *Prisoner of Zenda*, were the most popular. Other successful novels were: Marion Crawford's *Corleone*,* a tale of Sicily dealing with the Saracinesca family; George Moore's *Evelyn Innes*,* analyzing the musical temperament; *The School for Saints*,* by John Oliver Hobbes (Mrs. Craigie), introducing Lord Beaconsfield; Henry James's *The Two Magics** and *In the Cage*;* Neil Munroe's *John Splendid*;* Max Pemberton's *Kronstadt*,* a Russian tale, while *The Phantom Army** dealt with the Carlist cause of Spain in a most romantic fashion. Spain of forty years ago was described in Henry Seton Merriman's *In Kedar's Tents*,* and *Roden's Corner*;* Stanley Weyman in *Shrewsbury** chose England for his setting in the time of William III; Conan Doyle used his Egyptian experiences in the *Tragedy of the Korosko*; S. R. Crockett brought out *The Red Axe*;* a tale of the Baltic, and *The Standard Bearer*,* a tale of the Covenanters; Gilbert Parker left Canada scenes for a story of Jersey, *The Battle of the Strong*.* Gertrude Atherton's *American Wives and English Husbands** attracted much attention as did also *The Californians*,* and his *Fortunate Grace*; Ellen Thornycroft Fowler's *Concerning Isabel Carnaby*;* Mrs. Oliphant's *A Widow's Tale and Other Stories*, with preface by J. M. Barrie; Harold Frederic's *Gloria Mundi*;* Grant Allen's *The Incidental Bishop and Linnet*; Bret Harte's *Tales of Trail and Town*; William Morris's *The Sundering Flood*; Rider Haggard's *Dr. Thorne*, more in the nature of a tract than a novel; William Black's *Wild Eulin*;* Sir Walter Besant's *The Changeling*, a story of heredity; W. E. Norris's *The Widower* and *The Fight for the Crown*, in which he discusses the Home Rule question; Ian Maclaren's *Afterwards and Other Stories*; Maxwell Gray's *House of the Hidden Treasure*; Jane Barlow's *A Creel of Irish Stories*;* Douglas Staden's *The Admiral*, in which Nelson figures, and *Tricolor and Other Stories*; W. Clark Russell's *Romance of a Midshipman*; Barry Pain's *Wilmay*; Frankfort Moore's *The Millionaires*; Robert Hitchens's *The Londoners*;* Benjamin Swift's *The Destroyer*,* clever but repulsive; David Christie Murray's *A Race for Millions*, a detective story; Stephen Crane's *Pictures of War* and *The Open Boat*; Louis Becke and Walter Jeffrey's *The Mutineer*; Becke's *Rodman the Boatsteerer*; John Buchan's *John Burnet of Barns*; Silas Hocking's *In Spite of Fate*, a Cornwall story. M. E. Francis's *The Duenna of a Genius*; Hugh Clifford's *Studies in Brown Humanity*, tales of life in the Malay Peninsula; G. Mannville Fenn's *A Woman Worth Winning*; "Iota's" *Poor Max*; E. F. Benson's *The Vintage*, a story of the Greek war of Independence; M. E. Coleridge's *The King with Two Faces*;* Guy Boothby's *The Lust of Hate*; E. W. Hornung's *Young Blood*; R. Marsh's *The Datchett Diamonds*; Méné Muriel Dowie's *The Crook of a Bough*; Eden Phillpott's *Children of the Mist*; W. Tirebuck's *Meg of the Scarlet Foot*;* Lewis Sargent's *The Caprice of Julia*; Miss M. E. Braddon's *In High Places*, and *Rough Justice*; Miss Adeline Sargeant's *Miss Betty's Mistake*, *A Valuable Life* and *The Lady Charlotte*; M. P. Shiel's *The Yellow Danger*; Jane Helen Findlater's *A Daughter of Strife*; Mrs. Hugh Fraser's *A Chapter of Accidents* and *The Looms of Time*; F. Whishaw's *A Russian Vagabond*; Mabel Quiller-Couch's *Some Western Folk*; F. Gribble's *Sunlight and Limelight*; Miss Forbes-Robertson's *The Potentate*; Mrs. Walford's *Liddy Marget*; Mrs. Wood's *Weeping Ferry*; Mrs. Hugh Bell's *Miss Tod and the Prophets*; Mary E. Mann's *The Cedar Star*; Miss Betham-

Edwards's *A Storm-rent Sky*; Mrs. Henniker's *Sowing the Sand*; Kassandra Vivaria's *Via Lucis*; Basil Thomson's *The Indiscretions of Lady Asenath*, a story of Fijian life and customs; C. F. Keavy's *The Journalist*; Blackmore's *Dariel*; I. Zangwill's *Dreamers of the Ghetto*; Tom Gallon's *Dicky Monteith*; C. E. Raymond's *The Open Question*; F. Anstey's *Love Among the Lions*; "Zack's" *Life is Life*;^{*} and Rudyard Kipling's *A Fleet in Being*, one of the last publications of the year.

A noteworthy undertaking was Mrs. Ritchie's edition of her father's works, in which much unpublished material by Thackeray was included. Editions of Henry Fielding, of the novels of the Sisters Brontë, of Jane Austen, and the Edinburgh Edition of Robert Louis Stevenson with sketches by Stevenson not previously printed were also issued.

Poetry.—The most notable publication was the tiny volume by Henry Newbolt entitled *Admirals All and Other Verses*,^{*} remarkable for its spirit and rhythm, Conan Doyle's *Songs of Action*^{*} were dashing and became popular; Bret Harte's *Some Later Verses*; Lawrence Housman's *Spikenard*; Money Coutts's *The Revelations of St. John the Divine*; Laurence Benyon's *Porphyryion and Other Poems*; T. H. Warren's *By Seven Seas and Other Poems*; Rennell Rodd's *Ballads of the Fleet and Other Poems*; Miss E. Nesbit's *Songs of Love and Empire*; Katherine Tynan's (Mrs. Hinkson) *The Wind in the Trees*; F. W. Bourdillon's *Minuseula*; Miss Laura Alma-Tadema's *Realms of Unknown Kings*; R. C. Trevelyan's *Mallow and Asphodel*; Hardy's *Wessex Poems*; the collected *Poems* of William Watson; John Davidson's *Godfrida* and *The Last Ballad*; Lawrence Irving's mediæval play, *Godefroi and Yolande*; S. T. Stone's *Lays of Iona*; Arthur L. Salmon's *Life of Life*; Stephen Phillips's *Poems*^{*} and *Poems* by Ernest Hartley Coleridge were the most popular books of verse. Mr. W. E. Henley's delightful *Book of Verses* and *London Voluntaries* were republished as *Poems*; Mr. Henley and George Wyndham selected *The Poetry of Wilfred Blunt*; Canon Ainger edited the *Poems of Thomas Hood*; W. M. Rosetti wrote an introduction for a new edition of *The Blessed Damsel*;^{*} Cordery translated *Homer's Odyssey* into scholarly blank verse; Walter Leaf translated *Hafiz* in original metres; and three translations of the *Rubáiyát of Omar Khayyam* by Richard Le Gallienne, E. Heron-Allen, and John Payne (the later privately printed for the Villon society), led to a revival of interest in this immortal poem. A new and revised edition of Byron's *Poems, Letters and Journals* was undertaken by Ernest Hartley Coleridge and Rowland E. Prothero, and selections from the *Poems* of Mathilde Blind, by Arthur Symonds, and a new edition of the *Ingoldsby Legends* illustrated by Arthur Rackham, but far inferior to the clever pictures of Leech and Tenniel, sold largely.

Biography and History.—Among the books of this class were: Dr. Moritz Busch's *Bismarck*; a translation of Bismarck's *Reflections and Reminiscences*, by A. J. Butler; several Lives of Gladstone, including Justin McCarthy's which appeared shortly before his death, Sir E. W. Hamilton's and Mr. David Williamson's; Lionel Tollemache's *Talks with Gladstone*, and Sir Wemyss Reid's *Life of William Ewart Gladstone*. Barry O'Brien brought out a *Life of Charles Stewart Parnell*, which attracted attention. Other biographies were: *Nelson and his Times*, by Lord Charles Beresford and H. W. Wilson; *Drake and the Tudor Navy*, by J. S. Corbett; *The Great Lord Burleigh*, and *Sir Walter Raleigh*, by Martin A. S. Hume; *Charles I*, by the late Sir John Skelton; *Autobiography of the Duke of Grafton*, edited by Sir William Anson; *Judge Jeffreys*, by H. B. Irving; *Life of Sir William Wallace*, by Prof. Murchison; H. C. Macdowall's *Henry of Guise*; Thomas Hodgkin's *Charles the Great*; and Dr. James Gairdner's *History of the Life and Reign of Richard III, with the story of Perkin Warbeck*; Sidney Lee's *Shakespeare*; *Christina Rossetti*, by Mackenzie Bell; Mrs. Gerald Porter's *John Blackwood—Annals of a Publishing House*; G. R. Parkin's *Life of Edward Thring*; *The Books of William Morris*, described by H. Buxton Forman, included "some account of his doings in literature and in the allied crafts;" Augustine Birrell's *Sir Frank Lockwood*; Schweitzer's *Emin Pasha* (translation by Dr. Filkin); *Joseph Arch's Autobiography*, edited by the Countess of Warwick; Max Müller's *Auld Lang Syne*; Sir Herbert Maxwell's *The Hon. Sir Charles Murray, K. C. B.*; Wilfrid Ward's *Life and Times of Cardinal Wiseman*; Freeman Wills's *Life of W. G. Wills*; *Life and Letters of Henry Cecil Raikes*, by Henry St. John Raikes; *Study of Leo Tolstoy*, by G. H. Perris; C. H. Spurgeon's *Autobiography*; *Memoir of Sir Henry Rawlinson*, by Canon Rawlinson, Dr. Percy, Frankland's *Life of Pasteur*, and many others.

Sketches of Prof. Henry Drummond, by Dr. Robertson Nicoll and Ian Maclaren in *The Ideal Life and Other Addresses* should be mentioned.

History, Archæology and Travel.—Chief among the works of this nature was *Pausanias's Description of Greece*^{*} in 6 volumes, superbly illustrated and translated admirably by Dr. J. G. Frazer of Glasgow. The Egyptian Research Account published *The Ramessum* and *The Tomb of Ptahhetep*; Petrie's *Syria and Egypt from the Tel El Amarna Letters*; Grenfell and Hunt edition of *The Oxyrhynchus Papyri*,

(Egyptian Exploration Fund), which has been so talked about; and *Cuneiform Texts from Babylonian Tablets* in the British Museum were of great importance. Other books include Sayce's *The Early History of the Hebrews*; R. W. Frazer's *Literary History of India*; L. I. Shadwell-Lockhart's *Advance Through Tirah*; Col. H. D. Hutchinson's *Campaign in Tirah*; *Indian Frontier Warfare*, by Major Younghusband; *Indian Frontier Policy*, by Sir John Adye; and Sir Richard Temple's *Bird's-eye View of Picturesque India*, charmingly written and beautifully illustrated. *Australian Democracy*, by Henry D. R. Walker; *Life and Progress in Australasia*, by Michael Davitt; *New Zealand*, by W. P. Reeves, an authoritative book; *The Yukon Territory*, with introduction, by F. M. Trimmer; Haines and Taylor's *Pioneers of the Klondike*; *British West Africa*, by Major Mocklen Ferryman; *South Africa of To-day*, by Capt. Younghusband; a translation of Coillard's *On the Threshold of Central Africa*; and Hugh Egerton's *Short History of British Colonial Policy*; A. Henry Savage Landor's *In the Forbidden Land*,* an account of Tibet; Dr. Sven Hedin's *Through Asia*,* Captain Wellby's *Through Unknown Tibet*; A. Trevor-Battye's *A Northern Highway of the Tsar*; R. A. Freeman's *Travels and Life in Ashanti and Jaman*; Lionel Decle's *Three Years in Savage Africa*; J. W. Tyrrel's *The Barren Lands of Canada*; Prince Henry of Orleans's *From Tongking to India*; W. A. Pickering's *Pioneering in Formosa*; Harry de Windt's *Through the Gold Fields of Alaska*; H. Warrington's *Five Years in Siam*; Henry Kirk's *Twenty-five Years in British Guiana*; E. A. Reynolds-Ball's *The City of the Caliphs*; Arthur H. Neumann's *Elephant Hunting in East Equatorial Africa*; H. L. Darrah's *Sport in the Highlands of Kashmir*; H. Llewellyn Smith's *Through the High Pyrenees*; A. M. Knapp's *Feudal and Modern Japan*; Mrs. Isabella Bird-Bishop's *Korea and her Neighbours*,* D. H. Cameron's *Egypt in the Nineteenth Century*; and G. W. Steeven's *Egypt in 1898*,* and *With Kitchener to Khartoum** were important.

Criticisms, Essays and Miscellaneous.—The principal books of this character were: David Hannay's *The Later Renaissance of the Sixteenth Century*; *History of Italian Literature*,* by Dr. Garnett; *History of Spanish Literature*,* by Fitzmaurice-Kelly; Emil Reich's *Hungarian Literature*; a translation of Brunetière's *Manual of the History of French Literature*; Prof. Saintsbury's *English Literature*,* Duncan C. Tovey's *Reviews and Essays in English Literature*; Basil Worsfold's *The Principles of Criticism*; E. G. Gardiner's *Dante's Ten Heavens*; Miss M. E. Lowne's *Montaigne*; Zola's *Paris*,* translated by E. A. Vizetelly; Edward Clodd's *Tom Tit Tot*, the English variant of *Rumpelstilskin*; *Correspondence Between Robert Burns and Mrs. Dunlop*,* William Shakespeare—a critical study, practically an encyclopædia of Shakespearian material, by Dr. George Brandes; *The Homes and Haunts of Sir Walter Scott*; Sir Robert Burton's *The Jew, The Gipsy and El Islam*; Havelock Ellis's *Affirmations*; W. Ashton Ellis's translation of *Wagner's Prose Works*; Virnon Blackburn's *The Fringe of an Art—Appreciations in Music*; and Dr. Alfred Russell Wallace's *The Wonderful Century*,* a review of its successes and failures; Levignac's *Music-Dramas of Richard Wagner*, translated by Esther Singleton; Uzanne's *Fashion in Paris*,* translated by Lady Mary Loyd; Jerome K. Jerome's *Second Thoughts of an Idle Fellow*,* Lydekker's *Deer of all Lands*; Hudson's *Birds in London*, in which an astonishing number of species are well described; Sir Norman Locker's *The Sun's Place in Nature*; Prof. Milne's *Seismology*; *The Scientific Memoirs of Thomas Henry Huxley*, edited by Prof. Michael Foster and E. Ray Lankester; Prof. S. P. Thompson's *Light—Invisible and Visible*; Dr. A. C. Haddon's *The Study of Man*; Bernard Shaw's *Plays—Pleasant and Unpleasant*; Andrew Lang's *The Making of Religion*; Grant Allen's *The Evolution of the Idea of God*; *The Mysteries Pagan and Christian*, by Archdeacon Cheetham; several books of the *Polychrome Bible*,* edited by Paul Haupt.

A new edition of the Coptic version of the New Testament was begun by the Oxford University Press; W. Walsh's *Secret History of the Oxford Movement* was much read; and the Rev. R. E. Welsh wrote a protest against the Roman Catholic movement in the Church of England. Canon Gore published *Essays on Church Reform*; and Andrew Lang translated delightfully *Les Miracles de Madame Sainte Katherine*, from the Abbé J. J. Bourassi's edition of the *Fierbois Chapel Chronicles*.

Art.—The Art books were exceedingly fine. Among them we select: A monumental and superb work by Algernon Graves on *Sir Joshua Reynolds* (limited edition, 25 guineas); Walter Armstrong's *Gainsborough*,* Mrs. Bell's *Gainsborough*; Prof. Uzielli's *Leonardo da Vinci*; Spielmann's *Handbook on Millais*; Gérard's *Meissonier*; Lord Leighton's *Studies* (Fine Art Society); Wheatley's *Historical Portraits*; R. H. M. Stevenson's *Rubens*; Richmond's *Lectures on Leighton, Millais and Morris*; Rothenstein's *English Portraits*; Temple's *Victorian Art*; Prof. Colvin, *The Works of Maso Finiguerra*; Phillips's *Later Works of Titian*; Brinton's *The Renaissance in Italy*; Gaelyn, J. F. Millet and his Art; Gwynn's *Life of Northcote*; Rischgitz's *Drawings of Constable*; Pennell's *Charles Keene*; Pennell's *Pen Drawings*; Cust's *History of the Dilettanti Society*; Fell's *Song of Solomon*; Cruyer's *Chantilly*; *The Prussian Art Year Book*; Sizeranne's *The English School*, of great importance;

Ward's *Historic Ornament*; Walter Crane's *Bases of Design*; Binyon's *Catalogue of Drawings in the British Museum*; a new edition of *Ruskin's Works*; *Classical Sculpture Gallery*, published by Grevel; John Fulleylove's *Greek Landscape and Architecture*; Dr. Murray's *Greek Bronzes*; Miss Horner's *Greek Vases*; Fletcher's *History of Architecture*; Buckmaster's *Handbook of Architecture*; Hartshorne's *Old English Glass*; Day's *Windows*; Lord Bute's *Scottish Town Arms*; Davenport's *The Regalia*; and Miller's *Plastering*. Tolstoi's *What is Art*,* created heated discussion in England as in America.

II. *America*.—In the spring books on Alaska were in demand, as well as books on mining and various works on flowers, birds, sport and out-door subjects. The annual sale of European guide-books, with Baedeker in the lead, began. Rumours of war created a desire for manuals of tactics, lives of great generals, stories of famous campaigns, and novels that dealt with fighting. Books on Spain began to be called for all over the country. In April every kind of literature belonging to the war with Spain flooded the market, and pamphlets and maps, especially of Cuba and the Philippines, were sold in great numbers. *Cuba in War Time*, by Richard Harding Davis, Grover Flint's *Marching with Gomez*, *The Story of Evangelina Cisneros*, written by herself, and Latimer's *Spain in the Nineteenth Century* were in great demand. The supply of Foreman's *Philippine Islands* was soon exhausted, and Captain Mahan's *The Interests of America in Sea Power* and J. A. Fernald's *The Spaniard in History* were sold everywhere. The unsettled condition of trade caused publishers to postpone their spring publications and devote their attention to war-books and books on medicine, surgery, and nursing. The war supplanted the interest in Klondike and the books on Alaska ceased selling instantly. The June book out-put was smaller than ever, although the publishers made extensive preparations for the autumn and holiday seasons. Fiction sold rather well in July; *Rupert of Hentzau*, the sequel to the *Prisoner of Zenda*, being the most popular, and *Yesterdays in the Philippines*, by Joseph Earle Stevens, was a timely addition to the popular topics of the hour. In August the sale of war literature began to abate, but the end of the war occasioned a tremendous number of histories of the war with Spain, of every size and price, and adapted to every intelligence. The October and November out-put was remarkable in its size, variety, and artistic dress, and also for the diligence the publishers displayed in getting out their books in time for the revival of trade. A vast number of the books this season were importations.

The American Book Statistics are:

	New Books.	New Editions.
Fiction	724	181
Law	417	39
Theology and Religion.....	406	40
Education and Language.....	364	13
Juvenile	356	17
Literary, History and Miscellaneous.....	313	19
Poetry	288	15
History	244	38
Political and Social Science.....	243	14
Biography	172	23
Physical and Mathematical Science.....	143	31
Description, Travel	134	32
Fine Arts and Illustrated Books.....	144	19
Useful Arts	106	6
Philosophy	45	6
Domestic and Rural.....	40	3
Sports and Amusements.....	32	10
Humor and Satire.....	18	2
Medical Science, Hygiene.....	143	45
	4,332	554
		4,332

The total for 1897 was.....

4,886
4,928

Fiction.—Among the most popular novels and stories were: Maurice Hewlett's *The Forest-Lovers*; Mary H. Norris's *The House of the Quarries*; Mrs. Humphrey Ward's *Helbeck of Bannisdale* (which was much discussed); Richard Harding Davis's *The King's Jackal*;* George Moore's *Evelyn Innes*; John Kendrick Bang's *Ghosts I have met*; Mary E. Wilkins's *Silence and Other Stories*; W. D. Howell's *The Story of a Play*; Felix Gras's *The Terror*; Varina Anne Jefferson Davis's *A Romance of Summer Seas*; E. W. D. Hamilton's *Ye Little Salem Maid*; Winston

Churchill's *The Celebrity*; Charles G. D. Roberts's *A Sister to Evangeline*; Rudyard Kipling's *The Day's Work*; Clara A. Burnham's *A Great Love*; Mary Johnston's *Prisoners of Hope*; Maarten Maarten's *Her Memory*; Mary Tracy Earle's *The Man Who Worked for Collister*; Edward Noyes Westcott's *David Harum*; Joseph A. Attsheler's *A Herald of the West*; George R. R. Rivers's *The Count's Snuff Box*; Charles W. Hall's *Cartagena, or the Lost Brigade*; Max Pemberton's *Kronstadt and The Phantom Army*; S. R. Crockett's *The Red Axe* and *The Standard-Bearer*; Ian Maclaren's *Afterwards*; H. S. Merriman's *Rodin's Corner*; Thomas Nelson Page's *Red Rock*;^{*} Gilbert Parker's *Battle of the Strong*; Harold Frederic's *Gloria Mundi*; S. Weir Mitchell's *Adventures of François*;^{*} Paul Leicester Ford's *Tattle Tales of Cupid*;^{*} Mrs. Schuyler Crowninshield's *Where the Trade Wind Blows* and *Latitude 19°*; Joel Chandler Harris's *Tales of the Home Folks*; H. S. Edwards's *Sons and Fathers*; Benjamin Swift's *The Destroyer*; Grant Allen's *The Incidental Bishop*; Clinton Scollard's *A Man at Arms*; William Morris's *The Sundering Flood*; F. Hopkinson Smith's *Caleb West*;^{*} Frank R. Stockton's *The Girl at Cobhurst*,^{*} and *Associate Hermits*; Robert Hitchens's *The Londoners*; Opie Read's *The Waters of Caney Fork*; Paul Lawrence Dunbar's *The Uncalled*;^{*} Neil Munroe's *John Splendid*; Jane Barlow's *A Creel of Irish Stories*; William Le Queux's *Scribes and Pharisees*; James E. Farmer's *The Grenadier*; Frankfort Moore's *The Fatal Gift*; Theodore Watts-Dunston's *Aylwin*; Bernard Capes's *Adventure of the Comte de la Muette*; John Luther Long's *Madame Butterfly*;^{*} Henry James's *The Two Magics* and *In the Cage*; Thomas Wentworth Higginson's *Tales of the Enchanted Isles of the Atlantic*;^{*} Ambrose Bierce's *In the Midst of Life*; R. W. Chamber's *Ashes of Empire*; Edwin Pugh's *Tony Drum*; Robert Barr's *Tekla*; S. Baring-Gould's *Domitia*; Elizabeth Godfrey's *Poor Human Nature*; Amelia E. Barr's *The King's Highway*; Ella Higginson's *A Forest Orchid*; Helen Choate Prince's *At the Sign of the Silver Crescent*; Henry Gillman's *Hassan: a Fellah*; Kate Douglas Wiggin's *Penelope's Progress*;^{*} Ella W. Peattie's *In the Shape of Fear*; Henry B. Fuller's *From the Other Side*; Gelett Burgess's *Vivette*;^{*} George C. Eggleston's *Southern Soldier Stories*;^{*} Gertrude Atherton's *American Wives and English Husbands* and *The Californians*; H. E. Hamlin's *The General Manager's Story*; Sheppard Stevens's *I am the King*; Stanley J. Weyman's *Shrewsbury* and *The Castle Inn*; Anthony Hope's *Simon Dale*; A. Conan Doyle's *A Desert Drama*; W. E. Norris's *The Fight for the Crown*; Maxwell Grey's *Ribstone Pippins*; Maria L. Pool's *The Redbridge Neighbourhood* and *A Golden Sorrow*; E. F. Benson's *The Vintage* and *The Money-Market*; I. Zangwill's *Dreamers of the Ghetto*; Le Gallienne's *Romance of Zion Chapel*; H. G. Wells's *The War of the Worlds*; Joseph Conrad's *The Children of the Sea* (called in England the *Nigger of the Narcissus*); Mrs. Cotes's *A Voyage of Consolation*; Gunter's *Billy Hamilton*; and Anna Katherine Green's *Lost Man's Lane*; W. E. Tirebuck's *Meg of the Scarlet Foot*; and Ellen Glasgow's *Phases of an Inferior Planet*.

Of translations we may mention: Octave Uzanne's *Fashions in Paris*, translated by Lady Mary Loyd; Sienkiewicz's *Selanka*; *A Forest Picture* by Jeremiah Curtin; William Marchant's translation of Paul Bourget's *Voyageuses*, called *Antigone* and *Other Portraits of Women* and *Music and Musicians* by A. Lavignac; *The Story of Gösta Berling*, by Selma Lagerlöf, translated by Pauline Bancroft Flach; Albert Lavignac's *Music Dramas of Richard Wagner*,^{*} translated by Esther Singleton; and several translations of Rostand's *Cyrano de Bergerac*.

Travel, History and Biography.—G. W. Steeven's *Egypt in 1898 and With Kitchener to Khartoum*; Robert E. Peary's *Northward over the Great Ice*;^{*} Henry De Windt's *Through the Gold Fields of Alaska to Behring Straits*; A. P. Swineford's *Alaska*; G. H. Hepworth's *Through Armenia on Horseback*; Henry M. Stanley's *Africa—its Partition and its Future*; Benjamin Kidd's *The Control of the Tropics*; John D. Ford's *A Cruiser in the East*; A. R. Colquhoun's *China in Transformation*; A. Lebon's *Modern France*; Mrs. E. W. Latimer's *My Scrap Book of the French Revolution*; A. H. S. Landor's *In the Forbidden Land*; D. C. Worcester's *The Philippine Islands and their People*; J. E. C. Bodley's *France*; Henry Cabot Lodge's *The Story of the Revolution*; Jules Hoche's *The Real Bismarck*; Mary H. Krout's *Hawaii in Time of Revolution*; Frank R. Stockton's *Buccaneers and Pirates of our Coasts*; Grace King's *De Soto and his Men in the Land of Florida*; Charles Egbert Craddock's *The Story of Old Fort London*; Mrs. Hugh Fraser's *Japan*; Sven Hedin's *Through Asia*; B. A. Hinsdale's *Horace Mann* (Great Educator Series); Henry P. Johnston's *The Battle of Harlem Heights*; J. W. Tyrrel's *Across the Sub-Arctics of Canada*; Francis Wilson's *The Eugene Field I Knew*; James Bryce's *Impressions of South Africa*; John Thompson's *Through China with a Camera*; Maj.-Gen. Joseph Wheeler's *The Santiago Campaign*; John R. Spears's *Our Navy in War with Spain*; Marion Wilcox's *A Short History of the War with Spain*; Richard Harding Davis's *The Cuban and Porto-Rican Campaign*; J. C. Hemment's *Cannon and Camera*; Rufus F. Zognaum's *Ships and Sailors*; Gen. Nelson A. Miles's *Military Europe*; and F. N. Thorp's *A Constitutional History of the American People*.

^{*} The books marked with an asterisk denote American books that were published in London.

Essays and Miscellaneous.—Dr. Alfred Russell Wallace's *The Wonderful Century*; Alexander Robertson's *The Bible of St. Mark's*; Thomas Wentworth Higginson's *Cheerful Yesterdays*; Lilian Whiting's *The World Beautiful* (third series); Hamilton W. Mabie's *Essays on Work and Culture*; Kenneth Graham's *Dream Days*; Harry Thurston Peck's *Trimalchio's Dinner*; Kuno Franke's *Glimpses of Modern German Culture*; Austin Dobson's *Miscellanies*; Maurice Maeterlinck's *Wisdom and Destiny*; Benjamin W. Wells's *Modern French Fiction*; M. A. De Wolfe Howe's *American Bookmen*; H. E. Krehbiel's *Music and Manners in the Classical Period*; Thompson J. Hudson's *The Law of Psychic Phenomenon*; Washington Gladden's *The Christian Pastor and the Working-Church*; W. I. Lincoln Adams's *In Nature's Image*; Elizabeth Glover's *The Gentle Art of Pleasing*; W. A. Wyckoff's *The Workers—The West*; Maria Parloa's *Home Economics*; E. S. Thompson's *Wild Animals I have Known*; W. J. Holland's *The Butterfly Book*; John Kendrick Bangs's *Peeps at People*; Robert Burns's *Correspondence with Mrs. Dunlop*; Alfred Austin's *Lamia's Winter Quarters*; Mrs. J. K. Van Rensselaer's *The Goede Vrouw of Mana-ha-ta*; H. J. Whigham's *How to Play Golf*; Charles M. Shelton's *In His Steps*; Florence A. Merriam's *Birds of Village and Field*; James A. Rüs's *Out of Mulberry Street*; M. E. W. Sherwood's *Here, There and Everywhere*; and Henry George's *The Science of Political Economy*, a posthumous work, published by his son.

Little poetry of importance was published, for young or mature readers. A. B. Frost published *A Golfer's Alphabet*; E. W. Kemble *A Coon Alphabet* and *The Billy Goat and other Comicalities*; Oliver Herford *The Bashful Earthquake*; and Guy Wetmore Carryl *Fables for the Frivolous*. Probably the most amusing book of the year was F. P. Dunne's *Mr. Dooley in Peace and in War*.

Among the successful juvenile books we mention: Gertrude Atherton's *The Valiant Runaways*; Laura A. Richards's *Rosin the Beau*; Elbridge S. Brook's *A Son of the Revolution*; Pansy's *Reuben's Hindrances*; W. O. Stoddard's *Success against Odds, The First Cruiser Out* and *With the Black Prince*; Clinton Ross's *Heroes of our War with Spain*; Tomlinson's *Two Young Patriots*; James Otis's *The Cruise of the Comet* and *Yule-Logs*; Amanda Douglas's *A Little Girl in Boston* and *Sherburne Girls*; Byron A. Dunn's *General Nelson's Scouts*; James Whitcomb Riley's *Child Rhymes*; Martha Finley's *Elsie on the Hudson*; Mrs. Molesworth's *The Magic Nuts*; Virginia Woodward Cloud's *Down Durley Lane*; Charles F. Holder's *Treasure Divers*; and Mabel Osgood Wright's *Four-Footed Animals*.

Among the holiday books which had the largest sale were *The Little Minister*, by J. M. Barrie (the Maude Adams Edition); *Ave Roma Immortalis*, by F. Marion Crawford; *In the Forest of Arden*, by Hamilton W. Mabie; *The Choir Invisible*,* by James Lane Allen; *The Beginnings of New England*, by John Fiske; *Miss America*, by Alexander Black; *The Lost Word*, by Henry van Dyke; *The Fair God*, by Lew Wallace; *Where the Ghosts Walk*, by Marion Harland; *The Pilgrim's Progress*, illustrated by the Brothers Rhead; *The Story of the Revolution*, by Henry Cabot Lodge; *Home Life in Colonial Days*, by Alice Morse Earle; and *Turrets, Towers and Temples* by Esther Singleton.

Among the other art and holiday books we may cite: Armstrong's *Gainsborough*,* the Rheads illustrated edition of *The Idylls of the King*; *Volpone*, illustrated by Aubrey Beardsley; Phil May's *Sketch-Book* and *Gutter-Snipes*; Walter Copeland Perry's *The Women of Homer*; Tissot's *Life of Jesus Christ*; Anthony Hope's *The Adventures of the Lady Ursula*; Henrietta Ronner, *the Painter of Cats*; and Clara E. Clement's *Angels in Art*.

Regarding the book sales in London for 1898, the Athenæum says:

"A general survey of the book sales of 1898 shows that early printed works, whether English or foreign are, as heretofore in great demand, even at prices which are continually advancing. These are the books that find their way ultimately into large public collections, and *in transitu* to the temporary possession of owners to whom money is no object. Every year sees their number decrease, and it needs no prophet to predict that in the near future they will be conspicuous by their entire absence from the largest private libraries. The Kelmscott books are rapidly rising in value, as already stated, and the same remark is applicable to first editions of the earlier works of R. L. Stevenson and Mr. Rudyard Kipling. Sporting books, especially those with colored plates, appear to be rapidly taking the place of first editions, illustrated by such talented artists as the Cruikshanks, 'Phiz,' and Leech, at one time all the rage." Perhaps the most interesting sale was that of the late William Morris on December 5-10, containing valuable manuscripts on vellum and specimens of early printing. The total amount realized was £10,992 for 1,215 lots. The highest sum £225 was given for a manuscript *Testamentum Novum Latinum* of the 12th century.

The collection of Bibles owned by the late Rev. William Makellar contained a copy of the Mazarine Bible (of which only twenty-five copies are known), which was sold for £2,950. This was known as the Syston Park copy and was sold in 1884 for £3,900. The whole Makellar library fetched £11,118.

The third and final portion of the superb Ashburnham library realized £62,712 7s. 6d. The first and second portions were sold in 1897. The library was collected by the late Bertram, fourth Earl of Ashburnham (1797-1878), who collected perfect editions of books that he fancied. He owned among other things twenty Caxtons and a marvelous number of manuscripts. Among the high prices of this sale were £800 for the first five editions of *The Compleat Angler*; £355 for a vellum copy of *Le Roman de la Rose*; £585 for a first folio of Shakespeare; £225 for a *Goodly Primer in English*; £150 for a first edition of John Knox's *Liturgy* (Edinburgh, 1565); £240 for the *Booke of Common Praier* (1559); and £190 for *Pliny's Historia Naturalis* (1472).

The most important sale in America was that of the library of Charles Deane of Cambridge, consisting almost entirely of Americana. The prices fetched showed that there is no lack of interest in books relating to the history of this country. John Smith's *True Relation* of such occurrences and accidents of note as had happened in Virginia (London, 1608), brought \$1,425; Robert Cushman's sermon preached at Plymouth in New England, December 9, 1621, realized \$1,000. This was the first sermon preached in New England and only about six copies are known; and Winslow's *Good News from New England* (London, 1624), was sold for \$800. Another important sale was that of the Snow library in Boston.

In closing this necessarily statistical article, we should draw attention to deaths of several men and women of letters. Possibly Lewis Carroll was the most regretted of all. Gladstone held, perhaps, a higher place in letters than in statecraft, yet at his age, of course, his work was done. Harold Frederic, James Payn, Blanche Willis Howard, and William Black were among death's victims.

LITHOGRAPHIC LIMESTONE. Hitherto, practically all of this material used in America came from foreign sources, but in 1898, 112 tons were produced in Utah, and the locality may become of importance. Additional beds are reported from near Brandenburg, Kentucky, but not much importance is to be attached to new discoveries until they have proven themselves of commercial value.

LIVER DEXTRIN. Josef Seegen has isolated a new carbohydrate from the liver by extraction with water. It does not reduce Fehling's solution, but by prolonged heating with dilute mineral acid in a closed tube is converted into glucose. It requires 90 per cent. of alcohol to precipitate it. This substance for which the name is proposed is found in large quantities in the liver.

LIVER PIGMENTS. Two hepatic pigments have been isolated, which the discoverers Dastre and Floresco have named ferrin and cholechrome. These have been isolated from the liver which has been freed from blood. Ferrin is a ferruginous albuminoid compound which resembles closely the ferratin of Schmiedeberg. It is readily soluble in water and in dilute acids and alkalies, but is insoluble in alcohol and chloroform. Cholechrome on the other hand, is soluble in chloroform, but insoluble in water; it is intermediate in character between the lipochromes and biliary pigments.

LIVERPOOL, the most important maritime city of England, is situated on the north bank of the Mersey, Lancashire, and has a population estimated in 1897 at 633,078. In 1897 the total tonnage cleared exclusive of coast-wise shipping was 10,883,024. Great improvements and extensions have been made recently in the dock system. In 1898 Parliament passed further legislation providing for deepening and otherwise improving the docks. The expenditure of a vast sum of money had already been authorized by Parliament, and besides this expenditure, which is for extraordinary improvements, large sums are spent on ordinary improvements from time to time.

LOCKWOOD, SIR FRANCIS (created 1894), Liberal Member of Parliament for York from 1885, died December 19, 1897. He was born at Doncaster, England, in 1847; received his B. A. from Caius College, Cambridge, 1869; became barrister, Lincoln's Inn, 1872, and Q. C. 1882. He was made Recorder of Sheffield in 1884 and M. P. for York the following year after two unsuccessful candidatures, at King's Lynn in 1880, and York in 1883. In 1894-95 he was Solicitor-General and in 1896 accompanied Lord Chief Justice Russell to America, when the latter addressed the American Bar Association at Saratoga, New York.

LOCOMOTIVE. See RAILWAYS (paragraph Locomotives).

LONDON. On February 2, 1898, twenty parishes presented a petition to the Prime Minister and the Lord President of the Council declaring that the metropolis had long ceased to be an ordinary town and had become a collection of large towns, each of which was entitled to its own municipal government. The petition was favorably received by the government and action in the matter was promised. Such a division of the territory under the London County Council was opposed by the Progressive members of that body on the ground that the result would be oppressive to the inhabitants of the poorer portions of the city who would have to provide for local

necessities without the aid of the wealthier districts. The Moderates, who favored this plan, had a slight majority in the Council, but at the elections which took place on March 3, 1898, seventy Progressives and forty-eight Moderates were returned.

LONG, JOHN DAVIS, Secretary of the Navy in the McKinley Cabinet, was born in Buckfield, Oxford county, Maine, October 27, 1838. He was educated at the common school, Hebron Academy, Maine, and Harvard College, being graduated from this institution in 1857. After teaching school for two years in Westford Academy, Massachusetts, he studied law in private offices and the Harvard Law School, and was admitted to the bar. In 1875-78 he was a member of the Massachusetts legislature and during the last three of these years was Speaker of the House. In 1879 he was Lieutenant-Governor, and Governor in 1880, 1881, and 1882; for several years he was on the State House Construction Commission of Massachusetts and was a Republican member of the Forty-eighth, Forty-ninth, and Fiftieth Congresses. He is senior member of the law firm of Long and Hemenway. On March 5, 1897, he was appointed and confirmed Secretary of the Navy in President McKinley's Cabinet. It should be remarked that during the war with Spain the management of the Navy Department was excellent, and, in the public view at least, served as a striking contrast with the Department of War, which, as is well known, was severely criticised. Mr. Long is the author of a translation of the *Æneid* and has written a volume of poems, chiefly *vers de société*. His present home is at Hingham, Massachusetts.

LOUISE WILHELMINA FREDERIKA CAROLINA AUGUSTA JULIA, wife of Christian IX of Denmark, died at Copenhagen, September 29, 1898, surrounded by her family, including her daughters the Dowager Empress of Russia and the Princess of Wales and her son the King of Greece. The Queen had been failing in health for many weeks and her death was not unexpected. She was the daughter of William, Landgrave of Hesse-Cassel, and on May 26, 1842, married Christian, the fourth son of William, Duke of Schleswig-Holstein-Sondersburg-Glücksburg. "On the death of King Frederick VII, on November 15, 1853, Christian became King of Denmark according to the treaty of London, signed on May 8, and the Danish law of succession, enacted on July 31" of the same year. Six children were born to her and the fact that they all contracted royal marriages led to her receiving the appellation of the "mother-in-law of Europe." Prince Frederick, the heir apparent, born June 3, 1842, married Princess Louisa, daughter of King Karl XV of Sweden and Norway; Princess Alexandra, born December 4, 1844, was married to Albert Edward, Prince of Wales, on March 10, 1863; Prince Wilhelm, born December 24, 1845, who was elected King of the Hellenes under the title of George I, in 1869, married the Grand Duchess Olga Constantina of Russia; Princess Marie Dagmar, born November 26, 1847, by her marriage with Alexander III, the Czar of Russia, on November 9, 1866, became Empress Marie Feodorovna; Princess Thyra, born September 29, 1853, was married to Prince Ernest August, Duke of Cumberland; and Prince Waldemar, born October 27, 1858, having declined an election to become Prince of Bulgaria, married Princess Marie d'Orleans, eldest daughter of the Duc de Chartres, of the house claiming the French crown.

Queen Louise was not only loved by her Danish subjects for her qualities of true womanliness and nobility of character, but was recognized by the statesmen of Europe as a clever diplomat. Bismarck sincerely complimented her on her shrewdness and political foresight.

LOUISIANA, a Gulf State of the United States, with an area of 48,720 square miles, Capital, Baton Rouge.

Agriculture.—Planting operations generally were seriously interfered with during 1897 by flood, drought, and yellow fever. Cotton and oats showing an increased production, but other crops declined. In the season of 1897-8 the production of cotton was 788,325 bales net, an increase in a year of 221,074 bales from the same acreage, 1,245,399. The crop was worth \$22,876,403. The following shows the production and value of the principal crops in the calendar year 1898: corn, 23,758,470 bushels, value \$9,740,973; oats, 662,333, \$251,687; potatoes, 688,740, \$516,555; and hay, 54,438 tons, \$511,717—total value, \$11,020,932. Live-stock comprised, horses, 143,593; mules, 90,904; milch cows, 125,747; other cattle, 182,690; sheep, 119,163; and swine, 796,498—total head, 1,458,595.

Manufactures, etc.—The largest production of sulphur in the United States was in 1896, and the increased output was wholly due to operations in Louisiana, which yielded about 80 per cent. of the whole amount. Work was suspended during the greater part of 1897, and the product was only about one-fourth of what it was the preceding year. Brick and tile work yielded \$270,910. The tobacco industry showed the manufacture of 45,683,588 cigars, 136,574,836 cigarettes, 1,361,344 pounds of smoking tobacco and 24,310 pounds of snuff. Distilleries yielded 733,903 gallons of spirits, chiefly alcohol. Three cotton mills, with a total of 71,792 spindles, consumed 16,065 bales of cotton during 1897-8.

Commerce.—During the fiscal year ending June 30, 1898, the imports of merchandise at the ports of New Orleans and Teche aggregated in value \$9,644,582, against \$16,618,727 in the previous year; and the exports, \$112,676,651, against \$101,497,072.

The imports of gold and silver ore, bullion, and coin were \$499,443 against \$610,242 in the previous years; exports nothing; making the total foreign trade \$122,810,676.

Banks.—On October 31, 1898, there were 19 national banks in operation and 8 in liquidation. The active capital aggregated \$3,360,000; circulation \$1,274,494; deposits, \$17,243,014; reserve, \$5,368,716. There were also (June 30) 27 State banks, with capital, \$3,700,595; deposits, \$9,289,036; resources, \$11,000,203; surplus and undivided profits, \$412,200; and 3 stock savings banks, with capital \$300,000; deposits, \$2,519,393; resources, \$3,109,876. The exchanges at the U. S. Clearing-House at New Orleans in the year ending Sept. 30, 1898, aggregated \$445,082,489, an increase of \$24,899,804 in a year.

Education.—At the close of the school-year 1896-97 there were 419,753 persons of school age in the State of whom 169,947 were enrolled in the public schools and 124,123 were in daily attendance. The percentage of enrollment by races was, white, 72.58; colored, 73.76. There were 3,682 teachers; 3,017 school houses; public school property valued at \$1,025,000; and expenditures \$989,310 including \$780,472 for teachers' salaries. For higher education there were 18 public high schools; 31 private secondary schools; 1 private and 2 public normal schools; 9 colleges and universities, co-educational and for men only; 3 colleges for women; and a theological, a law and 2 medical schools. The agricultural and mechanical department of the State University at Baton Rouge, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 181 periodicals, of which 20 were dailies, 143 weeklies and 10 monthlies.

Finances.—The aggregate assessed valuation in 1897 was \$259,798,213, the highest since 1860 (\$435,787,265), and an increase in a year of \$7,886,897, of which all excepting \$256,418 was placed on the country parishes. The total recognized bonded debt on Feb. 15, 1898, was \$10,877,800, and there was a floating debt, made up of "baby" bonds and certificates, warrants, judicial expense fund, and a few other items, amounting in all to \$1,143,277. Outstanding unrecognized bonds aggregate \$4,747,935.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 1,295,000. A local estimate gave New Orleans 300,000.

The New Constitution.—In 1898 a general revision of the constitution was adopted; the main purpose of it was to restrict the Negro vote. An attempt in this direction was made in 1896, but failed, and it was then proposed to summon a convention to revise the constitution. This proposal was accepted by popular vote, and the convention completed its labors on May 12. The new constitution discriminated against the colored race more definitely than the recent provisions of Mississippi and South Carolina. The educational test is much more severe. The voter is required to write out his application for registration unless he be possessed of property assessed at not less than \$300. At the same time it is provided that no person who was a voter in any State on January 1, 1867, and no son or grandson of such person and no naturalized foreigner shall be subjected to this test, if twenty-one years of age on September 1, 1898, and a resident of the State for five years. Thus the Negroes are practically excluded, and in the November election only about 50,000 votes were cast, although 250,000 would probably have had the right to vote under normal conditions in proportion to the population of the State. There is also a poll tax provision as a prerequisite to voting, but it becomes operative only after the next general election in Louisiana in 1900. This imposes the tax of \$1 a year in aid of the public schools upon every male resident of the State between the ages of twenty-one and sixty years, with a few exceptions. Women tax-payers may vote upon questions of taxation submitted to the electorate, either in person or by written proxy. No one but a registered voter at the time is permitted to vote at any primary election or in any convention or other political assembly held for the purpose of nominating any candidate for public office. The apportionment of representation in all political conventions is to be made on the basis of population. The rights of those improperly denied registration may be enforced by summary proceedings. The legislature is to pass laws to insure fair party primary elections, conventions, or other assemblies nominating party candidates.

The new document is nearly one-third more bulky than the constitution of 1879. About half of it went into effect immediately, and the other half at different periods later. The new instrument has been criticised by some as incongruous in character and as containing provisions that will not work well in practice. It is stated that it has usurped the functions of the General Assembly and so burdened its provisions with exceptions that locally it is not understood, approved, or regarded as a permanent document. It is further said that in the reorganization of the judiciary a cumbersome and complicated system has been introduced. All judges, excepting those of

the Supreme Court are made elective, and the governor is left in practical control of the State, with the power to appoint nine-tenths of the office holders. Among other features of the constitution may be mentioned changes in the organization of the judiciary and the establishment of State boards of railway commissioners, of charities and corrections, of agriculture and immigration, of State and local boards of health, and of a State examiner, provisions against the leasing out of convicts, the sale of "futures" without intention of delivery, and against combinations and pools, and a provision for the payment of pensions to Confederate veterans and their widows. In regard to criminal trials, it provided that all cases in which the punishment may not be at hard labor shall until otherwise provided by law, (which shall not be prior to 1904) be tried by the judge without a jury; cases in which the punishment may be at hard labor shall be tried by a jury of five, all of whom must concur to render a verdict; cases in which punishment is necessarily at hard labor by a jury of twelve, nine of whom concurring may render a verdict; cases in which the punishment may be capital, by a jury of twelve, all of whom must concur to render a verdict.

The Constitutional Convention (April 26) appropriated \$50,000 for the expenses of the National Guard in view of the war with Spain and resolved: "That we hereby reaffirm our devotion to the glorious flag of our common country and pledge our best energies in defense of its honor and to lead it to greater glory."

Elections.—There were three parties for election in 1898,—Republican, Democratic, and Populist. The Democrats declared for the free and unlimited coinage of silver at the ratio of 16 to 1; for tariff for revenue only, and demanding that "sugar, rice, and lumber, a part of Louisiana's industry, be included in any tariff schedule that may be adopted by the General Government." The platform also denounced the American Protective Association (q. v.), and advocated the improvement of the Mississippi river. The Sound Money Democrats reaffirmed the Chicago Convention of 1892. The Populists denounced both Republicans and Democrats, put forward a full Bryan and Watson ticket, and refused to consider fusion. Only about 40,000 votes were cast, and the Democrats elected all their eight representatives to Congress. The State Legislature has a Democratic majority of 42 on joint ballot.

Other Events of 1898.—The President appointed Henry Demas (colored) Naval Officer for the port of New Orleans in September 1897, during the recess of Congress. His corrupt record in politics rendered him obnoxious to many Louisiana Republicans and in March 1898, the Senate Committee on Commerce by an unanimous vote made an adverse report upon the nomination.

The Louisiana State Board of Confederate Pension Commissioners at Baton Rouge met in December and arranged for and rejected claims. Only 1,091 pensions were allowed and only to a Confederate veteran or a widow of a Confederate veteran. This is the first pension bureau created in the South. The pensions are \$6, \$5, and \$4 a month.

National Representatives and State Officers.—Louisiana's Representatives in Congress are: Adolph Meyer, from New Orleans; Robert C. Davey, from New Orleans; Robert F. Broussard, from New Iberia; T. Brazil, from Natchitoches; Samuel T. Baird, from Bastrop; and Samuel M. Robertson, from Baton Rouge. All are Democrats. Senators: Donelson Caffery (Dem.), from Franklin; and Samuel D. McEnery (Dem.), from New Orleans. Officials (1899): Murphy J. Foster, Governor; R. H. Snyder, Lieutenant-Governor; John T. Michel, Secretary; A. V. Fournet, Treasurer; W. W. Heard, Auditor; M. J. Cunningham, Attorney-General; J. V. Calhoun, Superintendent of Education; Allen Gumel, Adjutant-General; I. G. Lee, Commissioner of Agriculture; and J. J. McCann, Commissioner of Insurance. All are Democrats. Chief-Justice, F. T. Nicholls; Associates, Newton C. Blanchard, Lynn B. Watkins, Jos. A. Breaux, and Henry C. Miller; Clerk, T. McC. Hyman. All are Democrats. The State legislature is composed of 88 Democrats, 31 Republicans, and 15 Populists.

LOUNSBURY, GEORGE E., Governor of Connecticut, was born in Poundridge, Westchester county, New York in 1839. His parents removed to Connecticut when he was a child. He graduated from Yale College in 1863 and three years later from the Berkeley Divinity School at Middletown. In 1867 he went into business in South Norwalk. In 1895 he was elected State Senator from the 12th district, this being the first public office which he held. Two years later he was re-elected to the State Senate. In the November election of 1898 he was elected Governor of Connecticut.

LOUVRE, ADDITIONS TO. See SCULPTURE.

LUDLOW, General BENJAMIN C., M. D., died in Los Angeles, California, January 10, 1898. He was born at Ludlow Station, Ohio, in 1831; was graduated from the medical department of the University of Pennsylvania in 1854. Soon after the outbreak of the Civil War he became captain of Fremont's Hussars at St. Louis, Missouri. Subsequently he served as aide on the staff of General Hooker at Chancellorsville and as inspector of artillery under General Meade at Gettysburg. He was engaged in many other battles of 1863-6, among which were Williamstown,

Mine Run, and Rappahannock. He became major in October 1862, lieutenant-colonel in July 1863, chief of cavalry under Gen. B. F. Butler in February 1864, subsequently took charge of the construction of the Dutch Gap canal, was made brevet brigadier-general in October 1864, for gallantry at Dutch Gap and at Spring Hill, Virginia, and was given command of the James and York river defence. In the following year General Ludlow resigned from the army.

LUDLOW, WILLIAM, Major-General, U. S. Volunteers, was appointed in December, 1898, the first American military governor of Havana city. He was graduated from West Point just before the outbreak of the Civil War, in which he served as a staff officer. Later he was a military attaché in several European capitals. In August 1895, he became a lieutenant-colonel, U. S. A., being assigned to the engineer corps. Shortly before he went to Cuba with the army of invasion he was appointed brigadier-general, U. S. Volunteers, and subsequently was promoted to the major-generalship. General Shafter put him in command of the first brigade of the second division, which captured El Caney, July 1, 1898. See **SPANISH-AMERICAN WAR** (paragraph Fight at El Caney).

LUGARD, Rt. Hon. Sir EDWARD, G. C. B., English Lieutenant-General (retired) and former Under-Secretary of State for War, died Oct. 31, 1898. He was born in 1810; educated at Sandhurst; entered the army in 1828; served in the Afghan War (1842), Sikh War (1845-46), Punjab Campaign (1848-49), Persian War (1856-57). He was Under-Secretary of State in the war department from 1861 to 1871. Throughout his career he served with distinction, and his promotions culminated in 1872, when he was made General.

LUNAR PHOTOGRAPHY. See **ASTRONOMICAL PROGRESS.**

LUTHERAN CHURCH IN THE U. S., composed of four bodies, the General Synod, 1,196 ministers, 1,496 churches, and 190,839 members; the United Synod in the South, 207 ministers, 427 churches, and 38,642 members; the General Council, 1,214 ministers, 2,056 churches, and 347,268 members; and Synodical Conference, 1,871 ministers, 2,451 churches, and 519,524 members. The General Synod and General Council co-operate in the Lutheran missions in India; the General Synod supports missions in Africa; and the United Synod of the South has a mission in Japan. The Women's Societies, the Luther League (q. v.), the Walther League, and the Christian Endeavor Associations accomplished useful work. The latest report of the Commissioner of Education shows 23 Lutheran institutions of higher education with 195 teachers, 1,650 students, and endowment funds of \$914,527. There are also sixteen independent synods: the United Norwegian, Joint Synod of Ohio, Buffalo, Hauge's Norwegian, Eilsen's Norwegian, Texas, German of Iowa, Norwegian Lutheran, Michigan, Danish in America, Icelandic, Immanuel, Suomai (Finnish), Norwegian Free, Slovakian, and Danish United, and besides these there are the Waldenstromians, with 140 ministers, 150 churches, and 20,000 members. The total number of Lutherans in the United States is 6,622 ministers, 10,663 churches, and 1,526,552 members.

LUTHER LEAGUE, a Lutheran organization of young people who labor for the good of their church, organized in New York City by delegates of six Lutheran Church societies, April 19, 1888. The first national convention was held in Pittsburgh, Pa., Oct. 30 and 31, 1895. Officers for 1899 are: President E. F. Eilert, New York; Secretaries H. C. Olsen, Chicago, Ill., and W. C. Stoeber, Philadelphia, Pa.; and Treasurer, Cornelius Eckhardt, Washington, D. C.

LUXEMBURG, a grand Duchy of Europe which was declared neutral territory by the Treaty of London in 1867. It has an area of 998 square miles, with a population on December 2, 1895, of 217,583. Its capital is Luxemburg with about 20,000 inhabitants. The majority of the inhabitants of the Grand Duchy are Catholics. It is a member of the German Zollverein. The executive authority is vested in the Grand Duke Adolf and the legislative in a Chamber of Deputies whose 45 members are chosen directly by the cantons for six years.

MACCABEES, THE ORDER OF, a fraternal society founded in 1881, has 8 camps and hives, 5,500 subordinate camps and hives, and 322,696 members. It has disbursed \$9,582,459 since its organization and \$2,081,193 during the last fiscal year. Supreme Commander, D. P. Markey; Supreme Record Keeper, N. S. Boynton. Headquarters, Port Huron, Mich.

McCARTHY, DALTON, Q. C., Independent leader in the Canadian House of Commons, representing North Simcoe, Ontario, died in Toronto, May 11, 1898, having been injured three days previously in a runaway accident. He was born at Oakley Park, Blackrock, near Dublin, October 10, 1836; at the age of eleven accompanied his parents to Canada and was educated at the Barrie, Ontario, grammar school. In 1858 he was admitted to the bar, and entered Parliament as Conservative member for Cardwell, Ontario, in December 1876. He was returned for North Simcoe in the following elections of 1878, 1882, 1887, 1891, and 1896. Mr. McCarthy continued his alle-

giance to the Conservative party until he was estranged in 1889 by the "Jesuit Estates Act," when he became an independent leader in the "Equal Rights" movement, but supported, however, his old party in its general policy. When the Manitoba school question arose he took a strong stand for provincial legislation in educational matters and for a national school system. Mr. McCarthy will be remembered especially for his connection with the liquor license act of 1883, bearing his name, which two years later was declared by the judicial committee of the Privy Council to be beyond the legislative authority of Parliament.

McCOLGAN, Mgr. EDWARD, vicar-general of the Roman Catholic diocese of Baltimore, Maryland, died in Baltimore, February 5, 1898. He was born in Donegal county, Ireland, May 1, 1812. In 1849 he organized the first Catholic temperance society in Baltimore, and subsequently the Order of the Sacred Thirst. This society now has branches in England and Ireland. In 1878 Cardinal Gibbons appointed him vicar-general and later he was made a monsignor by the Pope. On October 23, 1889, he celebrated a golden jubilee.

MacCOLL, EVAN, Scottish-Canadian poet, born in Kenmore, Lochfyneside, Argyleshire, Scotland, in 1808; died in Toronto, Ontario, July 24, 1898. He was known as the "Bard of Lochfyne."

MACEDONIA. See BULGARIA.

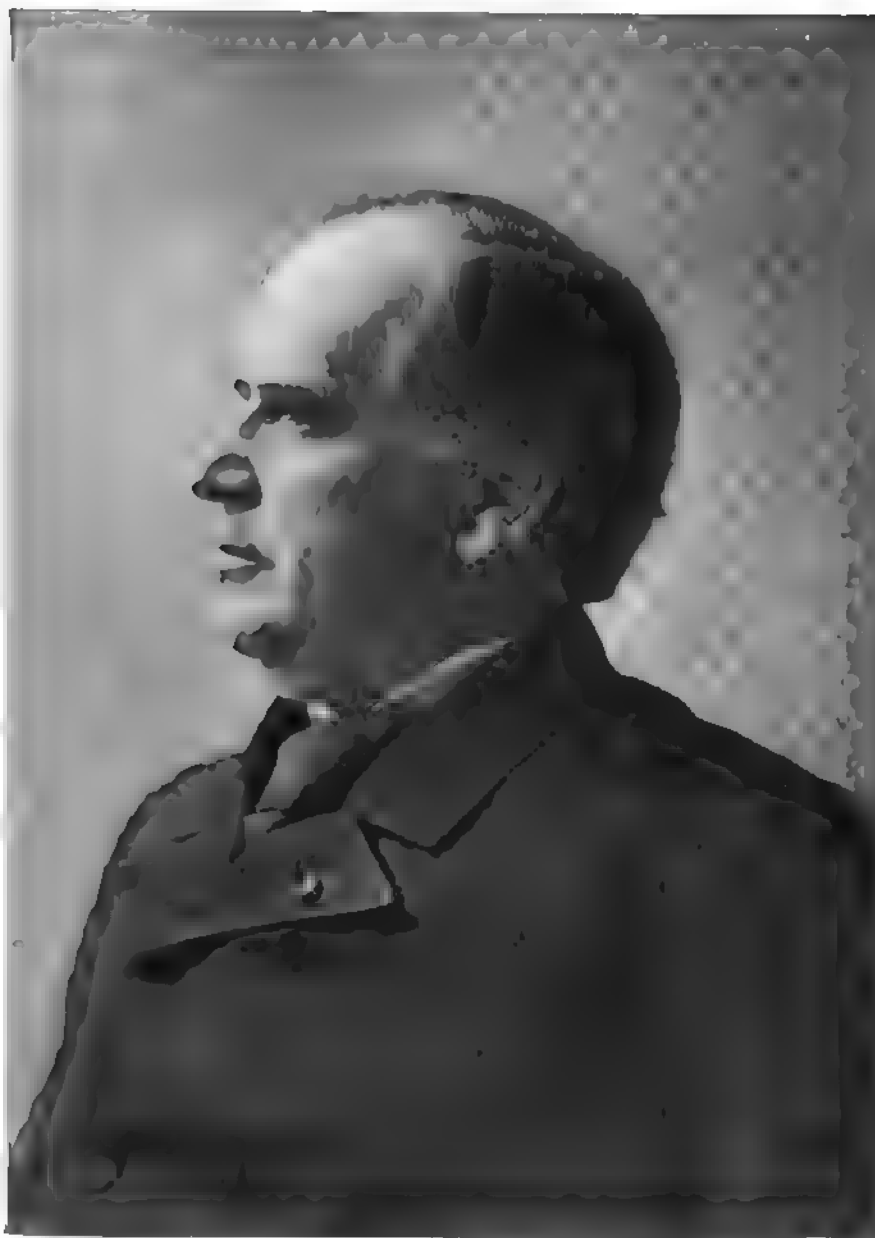
MACLAREN, IAN. See WATSON, JOHN.

McGOVERN, Rt. Rev. THOMAS, bishop of the Roman Catholic diocese of Harrisburg, Pennsylvania, died in Harrisburg, July 25, 1898. He was born in Ireland; was ordained priest in December, 1861, and succeeded to the bishopric of Harrisburg in January, 1888.

MACKAY, ERIC, an English writer, died June 2, 1898. He was born in London, January 25, 1851, and received his education in Scotland and Italy. He composed his well-known *Love Letters of a Violinist*, of which 35,000 copies have been sold, while taking long walks through the country. Mr. Mackay was a violinist of no mean ability. Among his other publications are: *The Lover's Missal*, *A Lover's Litanies*, *A Song of the Sea*, *Gladys the Singer*, *Arrows of Song*, *My Lady of Dreams*, *Nero and Actæa* (1891).

McKENNA, JOSEPH, Associate Justice of the United States Supreme Court, was born in Philadelphia, Pa., in 1843. Since 1855, when he went west with his parents, he has been a resident of California. After his graduation from St. Augustine College at Benicia, Cal., he studied law and was admitted to the bar; in 1866 he was elected district attorney for Solano county and served two consecutive terms. He was twice elected to the California legislature, the first time being in 1875, but it was not until his third candidacy for Congress that he was elected (1885). He remained a member of the House of Representatives until he was appointed by President Harrison to the judgeship of the United States Circuit Court for the Ninth, or Pacific Slope, Circuit. As a member of the House he was distinguished for having assisted Mr. McKinley in formulating the tariff law of 1890; and at the time of his appointment in 1892, he had the honor of being the only congressman west of the Rocky Mountains who was on the Committee of Ways and Means. In March 1897, he entered President McKinley's Cabinet as attorney-general, but in December of the same year he received an appointment by the President to the United States Supreme Court as associate justice to fill the vacancy made by the retirement of Justice Field. The appointment met with much disapproval both in the Senate and on the part of the public. The two objections urged against Mr. McKenna were his alleged incompetency and the fact that he is a Roman Catholic. Objection on the latter ground of course should have had little weight, and it hardly seems that the other objection was well taken, for the previous positions of United States Circuit Judge and Attorney-General seem to be fitting preliminaries to the higher position on the Supreme Bench. The fact that Mr. McKenna had received an appointment to an important judgeship by President Harrison had much weight, for President Harrison's judicial appointments were known to have been of a high order. Mr. McKenna's appointment to the Supreme Court was finally confirmed January 21, 1898.

McKINLEY, WILLIAM, twenty-fifth President of the United States, elected for the twenty-eighth quadrennial term, was born at Niles, Ohio, January 29, 1843. The McKinleys were of Scotch-Irish descent and came to America about a century and a half ago. William McKinley, father of the President, married in 1829 Nancy Campbell Allison, who was of English and Scotch-German descent; the President is the seventh of their nine children. Iron manufacturing and molding was the trade of the President's father and grandfather; his father was a man of ability and character, in religion a devout Methodist, and in politics an ardent Whig and Republican. He lived to see his son governor of Ohio, and Mrs. McKinley saw him president; she died December 12, 1897, aged eighty-eight. William's education was begun in the public schools of Niles, but when he was nine years old, the family moved



WILLIAM MCKINLEY.

to Poland, Mahoning county, Ohio, where his education was continued in Union Seminary. He remained here until he entered Allegheny College, Meadville, Pa., in 1860. Soon after this, although he was fond of athletic sports, his health failed on account of over study. Upon recovery he became a clerk in the Poland post-office, and held this position when the war broke out in 1861. On June 11 of this year McKinley enlisted as a private in Company E of the Twenty-third Ohio Volunteer Infantry; the Twenty-third Ohio became a famous regiment and numbered among its officers and men Gen. W. S. Rosecrans, Gen. R. B. Hayes, who became President of the United States in 1877, Gen. E. P. Scammon, Gen. James M. Comley, Col. Stanley Matthews, and many other well known men. The regiment saw active service throughout almost the entire war. McKinley served on the staff of R. B. Hayes, George Crook, and W. S. Hancock. The four years of army life proved beneficial to McKinley, who was much stronger at the close than at the beginning of the war. Of his military career it may be briefly said that both as private and officer, both in the commissary department and in the fighting line, he was courageous, clear-headed and calm. For services rendered in the winter camp at Fayetteville he received his first promotion, becoming a commissary sergeant, April 15, 1862. After the summer's campaign in Virginia McKinley's regiment took part on September 14 and 17 in the battles of South Mountain and Antietam, and it was for his extraordinary services as commissary sergeant during the latter battle that McKinley was promoted to a lieutenancy. Not long after this the regimental colonel, R. B. Hayes, entered in his diary: "Our new second lieutenant, McKinley, returned to-day—an exceedingly bright, intelligent, and gentlemanly young officer. He promises to be one of the best." And at a later date he added, "He has kept the promise in every sense of the word." On February 7, 1863, while at Camp Piatt, he was promoted to first lieutenant, and on July 25 of the following year, when he was but twenty-one, he was made captain for gallantry and faithfulness in the battle of Kernstown (near Winchester) July 24. Previous to this his regiment had taken part in engagements at Cloyd's Mountain, New River Bridge, Lexington, Buffalo Gap, Buchanan, Otter Creek, Lynchburg, and Bufford's Gap. At Berryville, September 3, 1864, McKinley's horse was shot under him. On March 14, 1865, he received his commission as major by brevet "for gallant and meritorious services at the battles of Opequan, Cedar Creek, and Fisher's Hill." Mr. McKinley was a supporter of the administration of President Lincoln, for whom he cast his first ballot, the 11th of the preceding October. He was mustered out with his regiment July 26, 1865. Throughout the war he had never had a day's leave of absence on account of illness; he had only one furlough, and that a short one; and he was active in every engagement in which his regiment took part.

Upon leaving the army he returned to his home in Poland and began the study of law with Judge Charles E. Glidden and David M. Wilson, of Youngstown; he subsequently studied at the Albany (N. Y.) Law School and was admitted to the Ohio bar in March 1867. He then settled in Canton, Ohio, which has since been his home, and soon attracted attention as a lawyer of much ability. Although Stark county was Democratic, he was elected prosecuting attorney in 1869, but was defeated for the same position two years later. From this time on Major McKinley gave much time to politics, and in 1876 was elected to Congress. That year the Democratic legislature of Ohio gerrymandered the State, but McKinley was nevertheless returned to Congress in 1878, as he was also in 1880, 1882, 1884, 1886, and 1888. He was unseated in 1884 and finally defeated in 1890, when his district was gerrymandered again. In 1888 he showed great vigor and ability in opposing the Mill's bill, which, it will be remembered, was an approximate embodiment of President Cleveland's policy of "tariff for revenue only." In 1884 Mr. McKinley was a delegate at large from Ohio to the national convention and aided in the nomination of James G. Blaine for the presidency; he similarly represented his State in the next national convention, where he supported John Sherman. It was at this time that his strength of purpose was sorely tried and that his high ideals of honor and loyalty became clearly manifest; for after the first day's balloting indications pointed that McKinley himself might very likely be nominated. In a stirring and serious address he demanded that no votes be cast for him. In 1891 he was elected Governor of Ohio by a majority of about 21,000 over ex-Governor James E. Campbell, Democrat. The issue at stake was chiefly the tariff, but Mr. McKinley also placed himself in opposition to the free coinage of silver. To the national convention of 1892 at Minneapolis he was again delegate at large from Ohio and was made permanent chairman. Notwithstanding the fact that many delegates wished to nominate him for the presidency, he believed that President Harrison deserved renomination, and gave him his support. Mr. McKinley's name was not brought before the convention, but he received 182 votes. In 1893 he was reelected Governor of Ohio, having a majority of 80,995. At the expiration of this term he returned to Canton. He had been a political speaker known and admired throughout the country, and his popularity and the confidence of the people

in his principles and purposes were constantly increasing; hence, there was little surprise when on the first ballot he was nominated for President at the national Republican convention at St. Louis in June 1896. The vote was as follows: McKinley, 661 1-2; Reed, 84 1-2; Quay, 61 1-2; Morton, 58; Allison, 35 1-2. In the November election the popular vote was 13,930,942, of which the McKinley electors received 7,104,779, being a plurality of 601,854 over Mr. William Jennings Bryan, of Nebraska, and a majority over all candidates of 311,742. The vote in the Electoral College was 271 for McKinley and 176 for Bryan. The issues on which the campaign was fought were chiefly the free coinage of silver and the restoration of a protective tariff; the monetary question, however, was preeminent and undoubtedly the Republican candidates received the votes of a great many who did not agree with Mr. McKinley's tariff ideas. The States carried by McKinley and Hobart were: California, Connecticut, Delaware, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin. Mr. McKinley made no campaign tours, but addressed thousands who flocked to his home in Canton. On March 5, 1897, the day after his inauguration, the President made the following cabinet appointments, which were immediately confirmed by the Senate: Secretary of State, John Sherman, of Ohio; Secretary of the Treasury, Lyman J. Gage, of Illinois; Secretary of War, Russell A. Alger, of Michigan; Secretary of the Navy, John D. Long, of Massachusetts; Secretary of the Interior, Cornelius N. Bliss, of New York; Secretary of Agriculture, James Wilson, of Iowa; Attorney-General, Joseph McKenna, of California; Postmaster-General, James A. Gary, of Maryland. Some of the more important diplomatic appointments were: Ambassador to Great Britain, John Hay; Ambassador to Germany, Andrew D. White; Ambassador to France, Horace Porter; Minister to Russia, Ethan A. Hitchcock; Minister to Spain, Stewart L. Woodford. At a special meeting of the Fifty-fifth Congress lasting from March 15, 1897, to July 24, a new tariff bill, called the "Dingley tariff" and superseding the "Wilson tariff," a Democratic measure became a law. The proposed arbitration treaty with Great Britain was rejected, \$200,000 were appropriated for the relief of sufferers from the Mississippi floods, and \$50,000 for distressed American citizens in Cuba. During the latter part of 1897 and during 1898 public interest centered in the President's attitude toward Cuba and the war with Spain; for a discussion of these subjects see CUBA, SPANISH-AMERICAN WAR and UNITED STATES. It may be said here, however, that the policy of the President has on the whole been commendable and generally satisfactory. His policy, nevertheless, has met with much criticism from the minority opposition, but he has constantly maintained a firm and conservative position. The war with Spain, which ostensibly began merely for humanity's sake, ended with territorial expansion as a new but fixed policy of the United States. In this the President had the popular approval, but many of his critics gave vent to dark forebodings such as, in the event of Philippine annexation, "the downfall of the American Republic will date from the administration of William McKinley."

Several changes have taken place in the cabinet since March 1897. In December 1897, the Senate concurring in January 1898, the President transferred Attorney-General McKenna to the Supreme Court; the appointment of John W. Griggs, of New Jersey, to fill the vacancy was confirmed on January 25. Postmaster-General Gary resigned April 18, 1898, and the appointment of Charles Emory Smith, of Pennsylvania, to the position was confirmed three days later. In the same month Secretary of State Sherman resigned and was succeeded by Assistant Secretary Day, who in turn on September 16, 1898, resigned, and on September 30 the portfolio was assumed by Ambassador John Hay. Secretary Bliss resigned in December, and on the 21st of the month the Senate confirmed the appointment of Ethan A. Hitchcock, of Missouri, Ambassador to Russia, to the head of the department of the Interior.

Mr. McKinley married, January 25, 1871, Miss Ida Saxton, of Canton, daughter of James A. and Catherine Dewalt Saxton. Two daughters were born to them, one in December 1871, and the other in 1873, but both died in early childhood. Mrs. McKinley is a woman of exceptional charm and nobility of character. The President is a member of the Methodist Episcopal Church. See UNITED STATES; SPANISH-AMERICAN WAR; CUBA; HAWAII.

McLANE, ROBERT MILLIGAN, ex-Governor of Maryland, died in Paris, France, April 16, 1898. He was born in Wilmington, Delaware, June 23, 1815. He was educated at Washington College, St. Mary's College, and West Point, being graduated from the last named institution in 1837; he remained in the army until 1843, when, having served in the Seminole War, he resigned and was admitted to the bar. He was a member of the Maryland legislature, 1845-47; in the latter year he was elected to Congress, and served for two terms. In 1853 he was appointed by President Pierce United States Commissioner to China, with the powers of a Minister Plenipotentiary, and was also assigned to Japan, Korea, Siam, and Cochin-China. He remained two

years and in 1859 was made Minister to Mexico, but resigned upon the outbreak of the Civil War. He was a member of Congress, 1878-80; was Governor of Maryland, 1884-85; resigning in the latter year to become Minister to France, which position he held until 1889.

MADAGASCAR is a large island lying off the eastern coast of Africa from which it is separated by the Mozambique channel. It is 975 miles long, 355 miles wide at the widest point, and contains an area of 228,500 square miles and a population variously estimated from 2,500,000 to 5,000,000. The most important element in the population is the Hovas, a race allied to the Malays and having considerable intelligence. Besides the Hovas, who number about 1,000,000, there are the Saklavas, also numbering about 1,000,000; the Bétsiléos, the Baras, the Betsimisarakas, etc. The foreign population comprises Creoles, Chinese, and other Asiatics together with a few Europeans. The capital is Antananarivo with a population of about 100,000 and the chief port is Tamatave on the east coast with a population of about 10,000. Missionary work has been very active in the island and has resulted in the conversion of a large part of the Hovas and other tribes. Recent estimates give the Christian population at 450,000 Protestants and 50,000 Roman Catholics, and it is said that 170,000 children are being educated at the schools connected with the missions. The chief occupations are cattle-breeding and agriculture. The principal products are rice, caoutchouc, sugar, coffee, cotton, and sweet potatoes, and the mineral resources include copper, gold, iron, lead, sulphur, graphite, and lignite. Valuable woods abound in the forests. Manufactures are in a crude stage, but silk and cotton weaving and metal working are carried on and textiles are made from the fibre of the rofia palm. The work is all done by hand, machinery not having been introduced. The commerce includes an export trade in India rubber, cattle, hides, horns, coffee, lard, sugar, vanilla, wax, gum copal, rice, seeds, and caoutchouc, and the chief trade is with France. The revenue is mainly derived from customs, licenses, sales of land, a land tax, and a small poll tax, but they have not proved sufficient to pay the expenses of the administration and the French government has had to provide for Madagascar in its annual budget. Tamatave has an excellent harbor but its communications with the interior are defective, the roads being so bad that no wheeled vehicles are used. In 1898, however, a concession was granted by the French government to a company for the building of a canal from Tamatave to Andevorante and a railway from Tamatave to Ivondro. There is a telegraph line between Tamatave and Antananarivo.

Madagascar is a French colony administered by a Governor-General (Gen. Gallieni in 1898) aided by an administrative council, the seat of administration being Antananarivo. France laid claim to Madagascar in 1642, but did nothing to make this claim good or to develop the country until very recent times. In 1882-84 a conflict arose between France and the natives of Madagascar on account of the latter's refusal to recognize the cession of certain territories on the northwest coast which the French claimed to have received from some native chiefs. In 1885 France secured Diégo-Suarez and after that maintained a French Resident General at the capital of Madagascar and assumed the right to control the affairs of the island. The French protectorate was recognized by Great Britain in 1890, but not by the native government. In 1895 the French sent an expedition into the interior, which captured the capital, and forced the queen to recognize the protectorate. In August 1896, France declared Madagascar a French colony. In February 1897, the queen was deposed.

MADRAZO, FEDERICO DE, famous Spanish portrait and historical painter and director of the Academy of Fine Arts in Madrid, died in that city August 21, 1898. He was born in Rome, Italy, in 1815; received his first lessons in painting from his father José de Madrazo, a well-known artist, and subsequently studied at Paris under M. Winterhalter. He exhibited various works at the Paris Salons and, removing to Madrid, became court painter. This position was at one time held by his father. He won a reputation for excellent portrait work, received many honors, both Spanish and foreign, and became a member of the Spanish Senate. Among his paintings are: "Godfrey of Bouillon," "Godfrey Proclaimed King of Jerusalem" (1839), "Maria Christina in the Garb of a Nun at the Bed of Ferdinand VII" (1843), "The Women at the Sepulchre," "Queen Isabella," "King Francisco," "Duchess of Alba," "Duchess of Medina Coeli," "Count Raczynski," "Countess of Vilckés," "Burial of Saint Cecilia in the Catacombs," "New Song," "Cigarette," "In Her Boudoir," "Matinée Musicale."

MAEDER, Mrs. (CLARA FISHER), actress, died at Metuchen, New Jersey, November 12, 1898. She was born in London, England, July 14, 1811. Her first appearance on the stage was made at Drury Lane in 1817, and ten years later she appeared in New York at the old Park theatre. She married in 1834 James Gaspard Maeder, who died in 1876. She retired in 1889. Her art was refined and she gained a merited fame in her profession. Her autobiography, edited by Mr. Douglas Taylor, appeared in 1897.

MAGNESITE. The production of Magnesite in 1897 was 1,907 short tons supplied entirely by California. It was used chiefly in that State for furnace linings in metallurgical works, for the manufacture of epsom salt and magnesia, and for the production of carbonic acid. The foreign supply was furnished chiefly by Austria, Germany and Greece, and in 1898 California continued to be the only American source.

MAIL TUBES. See PNEUMATIC DESPATCH.

MAINE, the most northeastern State of the Union, has a total area of 33,040 sq. m. Capital, Augusta.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 435,720 bushels, value, \$209,146; wheat, 35,256, \$31,378; oats, 5,047,812, \$1,716,256; barley, 326,943, \$183,088; rye, 17,514, \$14,712; buckwheat, 635,841, \$247,978; potatoes, 5,972,980, \$2,747,571; and hay, 1,184,058 tons, \$8,998,841—total value, \$14,148,970. Live-stock comprised, horses, 111,987; milch cows, 197,878; other cattle, 109,440; sheep, 246,628; and swine, 75,306—total head, 771,239.

Manufactures, etc.—The lumber trade of 1898 at the port of Bangor showed somewhat reduced shipments owing to the early and sudden closing of the river. The actual shipments were about 138,000,000 feet, but it was expected that the cut of the full season would reach the average of 150,000,000 feet. A special report on the herring industry of the Passamaquoddy region showed a capital investment of \$848,458; wage payments, \$584,593; cost of materials used, \$828,417; and output, 14,647,000 pounds of smoked and pickled herring and 36,496,000 pounds of sardines. Thirty-six canneries packed 680,949 cases, valued at \$1,641,303. The total value of the sea and shore fisheries in 1896 was \$4,326,692. In quarry products the output during 1897 was valued at \$2,059,321, principally in granite (\$1,115,327), in which the State ranked second, and limestone (\$742,877). Clay products yielded \$801,239, chiefly in brick and tile.

Commerce.—During the fiscal year ending June 30, 1898, the imports of merchandise at the various ports aggregated in value \$1,842,255; exports, \$8,769,553, a decrease in a year of \$610,388 in imports and an increase of \$2,994,532 in exports. The trade in gold and silver at the port of Bangor was, imports, \$401,312; exports, \$77,792, making the total foreign trade of the year \$11,090,912.

Railroads.—The total railroad mileage on Dec. 31, 1897, was 1,754.77, of which 37.75 miles were constructed during that year.

Banks.—On Oct. 31, 1898, there were 82 national banks in operation and 17 in liquidation. The active capital aggregated \$11,071,000; circulation, \$6,073,210; deposits, \$17,201,267; reserve, \$6,832,588. There were also 16 loan and trust companies with capital, \$1,386,400; deposits, \$5,365,548; resources, \$7,959,430; and 51 mutual savings banks, with deposits, \$60,398,760; resources, \$63,697,827; surplus and undivided profits, \$3,250,269. The exchanges at the U. S. clearing house at Portland in the year ending Sept. 30, 1898, aggregated \$72,795,243, an increase in a year of \$4,749,944.

Insurance.—On Jan. 1, 1898, there were 45 companies carrying on a fire and marine insurance business, and 3 engaged in life insurance—all working under State charters. During the previous year 2 new companies were incorporated in the State and 17 outside ones were admitted to State business.

Education.—At the close of the school-year 1896-7, the number of persons of school-age in the State was 210,341, of whom 132,139 were enrolled in the public schools and 96,571 were in daily attendance. There were 4,162 school houses; 6,727 teachers; public school property valued at \$4,081,951; and expenditures, \$1,593,864, of which \$1,164,328 was for teachers' salaries. The public high schools numbered 151; private secondary schools, 35; public normal, 4; private normal, 4; colleges and universities, coeducational and for men only, 3, with 47 professors and instructors, 712 students, and \$112,456 income; colleges for women, 2, with 13 instructors and 111 students; and theological and medical schools, 2 each. The State College of Agriculture and the Mechanic Arts at Orono, endowed by Congress and now known as the University of Maine, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898; in the last year there were 165 periodicals, of which 16 were dailies, 111 weeklies, and 27 monthlies.

Churches.—A local report gave the following denominational facts for May 1, 1898: Advent Christian, 110 churches, 75 ministers, 5,000 members; Baptist, 248 churches, 153 ministers, 20,392 members; Protestant Episcopal, 49 parishes and missions, 34 clergy, 3,801 communicants; Free Baptist, 252 churches, 155 ministers, 13,780 members; Congregational, 248 churches, 195 ministers, 21,833 members; Methodist Episcopal, 303 churches, 214 ministers, 19,484 members; Universalist, 84 churches, 44 ministers, 2,442 members; Friends, 24 meeting houses, 1,500 members; New Jerusalem, 4 churches, 363 members; Unitarian, 21 churches; Christian, 35 ministers, 3,600 members; Disciples, 7 churches, 500 members; Evangelical Lutheran, 2 churches,

500 members; Presbyterian, 2 churches, 2 ministers, 106 members; Church of God, 12 churches, 16 ministers, 250 members; and Roman Catholic, 93 churches, 92 clergy, 94,730 estimated Catholic population.

Finances.—On Jan. 1, 1898, the bonded debt was \$2,253,000, floating loan, \$200,000; resources, \$1,266,591; tax rate, \$2.75 per \$1,000. The assessed valuations (taken in even years) in 1896 comprised, real estate, \$257,389,047; personal property, \$71,111,947—total, \$328,500,994, an increase of \$4,022,673 in two years.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 688,000. Local estimates gave Portland 42,000.

Elections.—The State and Congressional elections were held Sept. 12, 1898. The Republicans re-elected their candidate for Governor, Hon. Llewellyn Powers, by about 25,000 plurality against 48,000 plurality in 1896. They also returned all four of their Congressmen. A constitutional amendment was submitted to the electorate providing that vacancies in the Senate shall be filled by an immediate election in the unrepresented district. It was carried by an overwhelming majority, 15,080 affirmative votes against 1,856 negative.

National Representatives and State Officers.—The four representatives from Maine in 1897 were: Thomas B. Reed, from Portland, Edwin C. Burleigh, from Augusta, Charles A. Boutelle, Bangor; and Nelson Dingley, Jr. All were Republican. Senators: William P. Frye (Rep.), from Lewiston, and a Republican. The officials are: Llewellyn Powers, Governor; Byron Boyd, Secretary; F. M. Simpson, Treasurer; John T. Richards, Adjutant-General; William T. Haines, Attorney-General; W. W. Stitson, Superintendent of Education; and S. W. Carr, Insurance Commissioner. All were Republicans. Chief Justice, John A. Peters; Associates, Andrew P. Wiswell, Lucilius A. Emery, William H. Folger, W. P. Whitehouse, Thomas H. Haskell, and Sewall C. Strout (the only Democrat); and Clerk, W. S. Choate. There are 25 Democrats and 157 Republicans in the State legislature. The Senate is entirely Republican.

MAINE, THE (Battleship). See SPANISH-AMERICAN WAR.

MALARIA. See CUBAN FEVER and PUBLIC HEALTH.

MALIE TOA LAUPEPA. See SAMOAN ISLANDS.

MALLARME, STEPHANE, well known French essayist and poet, was born in Paris, 1842; died there September 9, 1898. Among his publications are: *L'après-midi d'un Faune*, (1876); *Poésies*, (1887); *Les Poèmes d'Edgar Poe*, (1889); *Pages*, (1890); *Villiers de l'Isle-Adam*, (1890); *Vers et Prose*, (1892); *Vathek*, (1893); *La Musique et les Lettres*, (1895); *Divagations*, (1897).

MALLESON, Colonel GEORGE BRUCE, C. S. I., was born in London, May 8, 1825; died March 1, 1898. He was educated at Winchester College, and served thirty-five years in India, ten of which were in the army and the rest in government positions. He wrote *The History of the Indian Mutiny*, continuing Sir John Kaye's work on the same subject; he published other notable works on the history of India, including accounts of the decisive battles of India and a work entitled *The French in India*; among his writings are also *Lakes and Rivers of Austria*, and lives of *Warren Hastings*, *Lord Clive*, *Metternich*, *Akbar*, and the *Marquis of Wellesley*.

MALLON, Mrs. ISABEL ALLERDICE, American writer, died in New York City, December 27, 1898. She was born about 1859 in Baltimore, Maryland. Early in life she engaged in journalism, and for a number of years prior to her death she was a constant contributor to many well known periodicals. She wrote many clever essays and other articles under the pen name "Bab." Some of her more serious papers appeared in the *Ladies Home Journal* (Philadelphia) under the pen name "Ruth Ashmore;" she conducted in that paper the query column entitled *Side Talks With Girls*.

MALTA. An island in the Mediterranean sea belonging to Great Britain. It lies about 58 miles to the south of Sicily and has an area of 117 sq. m. (including Comino), with a population in 1896 of 176,231, including a British garrison of about 10,570 men. Its capital is Valetta with a population of about 50,000. Its chief importance is as a naval station with arsenals and dockyards, but it is also the seat of a thriving commerce. The main occupation is farming and its products include potatoes, cotton, oranges, figs, honey, and corn, besides live stock. Among manufactures may be mentioned matches, cotton and filigree work. Its commercial importance increased after the opening of the Suez Canal, when it became a prominent port of call, but as a trading centre it has declined somewhat since the building of larger vessels, the improvement in marine engines and the establishment of rival coaling stations at other ports in the Mediterranean. The United States Consular Report dated May 23, 1898, draws attention to the thriving trade of Malta with Great Britain, France and Austria, owing to their practice of sending business representatives to the island. The American trade has not kept pace with its rivals. A heavy duty bars out American grain. In 1898 there was a prospect of the opening of direct communication between the United States and Malta and a development of

American trade was expected to follow. The executive authority is vested in a Military Governor and executive council; the legislative in a council of government consisting of 6 official and 14 elected members. In 1898 the Governor was Lieut.-Gen. Sir Francis W. Grenfell.

MANGANESE. The output for 1897 was 11,108 long tons, valued at \$95,505, supplied chiefly by Georgia, Arkansas, and Virginia. The presence of a small percentage of phosphorus in many American deposits destroys their commercial value, and necessitates importing the larger part of the manganese used in this country. Some manganese is also obtained in the reduction of some iron, silver and zinc ores mined in this country. The foreign sources of supply in 1897 were Cuba, Brazil, Chile, and Europe.

MANITOBA, a province of the Dominion of Canada, with an area of 60,520 sq. m. Capital, Winnipeg. ●

Agriculture.—In the calendar year 1897, the production of wheat was 18,261,950 bushels; oats, 10,629,513; barley, 3,183,602; potatoes, 2,033,298; flax, 247,836; rye, 48,344; peas, 33,380; and roots, 1,220,070. Live-stock comprised principally 221,775 cattle; 100,274 horses; 74,944 swine; and 36,680 sheep.

Fisheries.—The value of the yield of the fisheries of Manitoba and the northwest territories together in 1896 was \$745,543; value of all apparatus employed, \$253,201; principal catch, whitefish, \$489,738; value of exports of fishery products (1897), \$206,007.

Mining.—The principal mineral production is coal, which in 1897 yielded 225,868 short tons in Manitoba and the northwest territories. In addition to its share in the total output Manitoba imported 25,267 tons for home consumption.

Commerce.—In the fiscal year ending June 30, 1897, the imports of merchandise aggregated in value \$2,858,966, which yielded \$644,281 in duties; exports, \$1,965,755. The registered merchant marine comprised 115 vessels of 7,272 tons.

Banks.—On June 30, 1897, there were 28 post-office savings banks, with 1,588 depositors and \$816,200 deposits. Exchanges at the clearing house at Winnipeg aggregated \$84,340,000, an increase of \$20,193,562 in a year. Loan companies and building societies had paid in capital, \$375,000; reserve, \$50,000; liabilities, \$1,015,902; loans, \$1,360,430; and assets, \$1,451,664.

Railways.—In 1897 the total length of railways was 1,575 miles, to promote the construction of which the Dominion and provincial governments had advanced \$2,626,612, and local municipalities \$595,600.

Education.—Public schools in 1897 numbered 1,068; school buildings, 860; teachers, 1,197; school population, 51,178; enrollment, 39,841; attendance, 21,500. Receipts aggregated \$825,774; expenditures, \$805,417, including \$445,204 for teachers' salaries. The Pope disapproved the compromise settlement of the long standing school controversy, but recommended moderation and a disposition on the part of Catholics to accept such partial concessions as could be obtained. (See CANADA, paragraphs on History.) There were 8 public libraries, with 34,730 volumes, and (1898) 54 periodicals of all kinds.

Finances.—The revenue of the province in the year ending Dec. 31, 1897, was \$683,706; expenditure, \$780,109; gross debt, \$5,793,843; assets, \$8,099,137—excess of assets over liabilities, \$2,305,294.

Population.—The Indian population in 1897 of Manitoba and the treaty limits of the Northwest Territories was 21,196. In Manitoba alone there were 54 schools for Indian youth, with enrollment, 1,732, and daily attendance, 886. The Indians cultivated 1,984 acres of land, had 3,454 head of live-stock, and received \$111,316 for their fish, fur, and other industries. Local estimate in 1898 gave Winnipeg 38,733 population. See also the article CANADA.

MANSFIELD, Fourth Earl of, WILLIAM DANIEL MURRAY, K. T., died August 2, 1898. He was born February 21, 1806. He was lieutenant-colonel of Stirlingshire militia, 1828-55; member of Parliament for Aldborough (1830), for Woodstock (1831), for Norwich (1832-37), for Perthshire (1837-40); Lord High Commissioner to the General Assembly of the Church of Scotland, 1852, 1858-59; Lord of the Treasury in the administration of Sir Robert Peel, 1834-35.

MANUFACTURES IN THE UNITED STATES. The past two years have been fraught with interesting events political, military and civil. The revival of confidence resulting from the settlement of the financial question threw large sums of money into the various manufacturing industries. Factories long idle or running on reduced time began to hum with renewed life. Railways and other large consumers of staple products placed unusually large orders and everywhere signs of better times began to appear. This industrial awakening has continued with growing proportions during the past year. Notwithstanding the large domestic orders booked in all departments of trade our foreign orders have been greater than ever before.

The ability of manufacturers of this country to meet the requirements of foreign markets and at the same time undersell the local manufacturers has been satisfactorily demonstrated, and the past year has witnessed a remarkable growth in our exports of manufactured articles. According to the reports received from the consular service, American steel, iron, machine tools, boots and shoes, furniture, bicycles, electrical supplies, hardware, cutlery, locomotives, etc., are increasing in popularity as they become known and used. This is due primarily to two causes, their excellence of quality and reasonable cost to consumers.

Notwithstanding statements to the contrary, it has been definitely established that owing to the very full use of automatic machines and various forms of labor-saving machinery American manufacturers can pay higher wages than are paid abroad and yet compete in foreign markets. In fact, they can sell their goods next door to the foreign manufacturer and at a lower rate. The entire credit of this seeming paradox must not, however, be given to machinery, for it is now quite generally admitted that the American operative has a greater producing capacity than his foreign cousins.

The Consular Journal and Greater Britain for April 7, 1898, in speaking of our manufacturing expansion said:

"The United States has already taken the place allotted to it when first the Pilgrim Fathers sowed the seed of a nation in the New World, and the country stands to-day as one of the greatest manufacturing centres of the world. Although it still remains, and will always continue to be, a principal granary for the world's food supply, the United States, with a rapidity that can not fail to excite our admiration, has raised itself from a mere grain-growing country to the more advanced condition of a home manufacturing industry, and is now working side by side with ancient countries in turning out manufactured goods which a refined civilization demands from the hand of man. * * * This marvelous growth is to be attributed to several causes, the first of which is the restless energy and strong inventive genius of the American people. These two predominating qualities have been an enormous power in the hands of the citizens of the great Atlantic Republic, and they have known how to turn it to the best advantage. But these two qualities which we have just now mentioned could not have asserted themselves so dominantly all over the world, had it not been for the wise support which the state authorities have always given to the enterprising efforts of her children, by whose intelligent labor she has become great."

During the year 1898 the importations of manufactured articles, that is, those ready for consumption, was \$82,570,687, while in 1897 the value was \$134,375,126 and in 1896 it was \$145,274,639, which figures show a remarkable decrease. The value of imported articles required by manufactures in various processes and known to the trade as "crude materials" amounted to \$204,543,917 in 1898, to \$214,916,625 in 1897, or a decrease of \$10,372,708 in one year.

The total exportation of manufactured articles for 1898 amounted to \$288,871,449 and exceeded those of 1897 by \$11,586,058, and those of 1896 by a far larger amount, namely, \$60,300,271. The exports of manufactures for 1898 exceeded those of any other year by about \$12,000,000, and at the same time imports decreased \$51,804,439 as compared with 1897.

In the following tables the importation of all classes of manufactured articles exceeding in value \$5,000,000 are given for the fiscal years 1897 and 1898. In this form they afford an opportunity to observe the decrease in importation along certain special lines:

Imported Manufactures.	1897.	1898.
Chemicals, drugs, etc.....	\$44,948,752	\$41,470,711
Cotton manufactures	34,429,363	27,266,932
Earthen and chinaware.....	9,977,297	6,686,220
Fibres, manufactures of.....	32,546,867	21,899,714
Glassware	5,509,626	3,669,919
Iron and steel manufactures.....	16,094,557	12,615,913
Leather, manufactures of.....	13,283,151	11,414,118
Oils (all)	5,594,111	5,197,886
Silk, manufactures of	25,199,067	23,523,110
Wood and manufactures of.....	20,543,810	13,858,582
Wool, manufactures of.....	49,162,992	14,823,768
Articles used in manufacturing:—		
Cotton, unmanufactured	5,884,262	5,019,503
Fibres, unmanufactured.....	12,336,418	13,446,186
Hides and skins.....	27,863,026	37,068,832
India rubber.....	17,558,163	25,545,391
Silk, unmanufactured ...	18,918,283	32,110,066

Articles used in manufacturing (continued) :—	1897.	1898.
Tobacco, unmanufactured	\$ 9,584,155	\$ 7,488,605
Wool	53,243,191	16,783,692

Articles for consumption :—		
Coffee	81,544,384	65,067,561
Fish (all)	6,108,714	5,984,980
Fruits and nuts.....	17,125,932	14,566,874
Sugar	99,066,181	60,472,703
Tea	14,835,862	10,054,005
Wines, spirits and malt liquors.....	12,272,872	9,305,504

The value of exports of the most important articles for the fiscal year 1898 was as follows :

Exported Manufactures.	1888.	1898.
Starch	\$ 202,932	\$ 1,850,353
Flax, hemp and jute manufactures.....	1,391,216	2,557,465
Instruments for scientific purposes	714,514	2,770,803
Cars, carriages, etc.....	2,243,756	3,424,419
Fertilizers	1,255,028	4,359,834
Tobacco, manufactures of.....	3,578,457	4,818,493
Paper, and manufactures of	1,078,561	5,494,564
Paraffine and paraffine wax	2,168,242	6,030,292
Cycles and parts of.....	.....	6,846,529
Agricultural implements	2,645,187	7,609,742
Chemicals, drugs, dyes and medicines.....	5,633,972	9,441,763
Cotton, manufactures of	13,013,189	17,024,092
Leather, and manufactures of	9,583,411	21,113,640
Copper, and manufactures of	3,812,798	32,180,872
Mineral oil, refined	47,042,409	51,782,316
Iron and steel, manufactures of.....	17,763,034	70,367,527

As already stated one of the prime causes for our increasing exports of manufactured articles is the wonderful ingenuity displayed by our manufacturers of automatic machinery and the perfection of our machine tools and labor-saving machines. Foreign manufacturers are slowly realizing this and large orders for machine tools have been booked by American firms. In fact in such great esteem are our tools and automatic machines held that they are being imitated as nearly as possible by foreign makers, principally German, who in some instances have been known to buy a line of American machines for templates to work from, each dimension being accurately reproduced. In another instance it was found that the name of the American manufacturer had been cut off and the name of the German firm inserted.

The relative growth of the exports of machines and machinery since 1885 is as follows for the countries named: United States 250 per cent.; Belgium 102 per cent.; Germany 80 per cent.; France 36 per cent.; Sweden 35 per cent.; and Great Britain 27 per cent. With regard to advances, discoveries or improvements in the methods or processes of manufacture, it is quite safe to say that such improvements as have been made are refinements in methods and slight changes in processes, a description of which involves a variety and technicality of detail which is beyond the scope of the present article. In the case of machine shop operation it may be said that milling machines, grinding machines, stamps, and punches and automatic machines of all sorts which reduce the amount of hand work upon any article of production are being used more and more. The old method of operating an entire factory from a single engine with long lines of shafting and miles of dirty, dusty belts is gradually but surely yielding to the better method of locating small electric motors near or on the machines, which they drive directly.

In machine and bridge shops traveling cranes, generally electric, continue to find increasing use and portable electric drills, hydraulic punches and pneumatic riveters and caulkers are rapidly displacing the old method of hand riveting, on account of their speed and reliability. Pneumatic riveters are regarded with especial favor in ship-building where they are found to cause a material saving. The various textile processes and machinery remain almost identically the same as for previous years.

Brass and brass making may be said not to have changed in the past 50 years. Steel making, which has practically supplanted iron making, has on the contrary grown in a few years to enormous proportions as a direct result of the Bessemer process. This industry is subject to perhaps as many and as varied changes as any of the industries. Owing to a better understanding of the materials entering into its composition and a refinement of methods of manufacture, the tensile strength,

elongation and elasticity of steel is being improved year by year, and a more reliable material is being turned out. This reacts to the benefit of all concerned and has resulted in a very large increase in its use for many new purposes.

In foundry practice, aside from the somewhat limited introduction of machine moulding and the better understanding of foundry materials permitting the production of a more even quality of iron, there is nothing new. Steel casting is being better understood and is, therefore, now largely replacing forged steel and cast iron, in the former case it having been found strong enough and cheaper, and in the latter case strong enough and not much more expensive.

Armor plate, which through the Harveyizing process of hardening was supposed to have reached a degree of perfection apt to be standard for some time, has again been improved at a bound by the Krupp process until it is now stated on good authority that the same protection can be obtained with a 25 per cent. reduction in weight.

The cost of aluminium is decreasing and in consequence it is now used for purposes for which it was early recognized as suitable, but for which it could not be used owing to its prohibitive cost. It is now being employed for the conductors of electric transmission lines where its low conductivity and comparatively low tensile strength are more than offset by its small weight.

In the electrical industries no radical departures can be heralded, such advances as have occurred being merely the increase in size of generating units and translating apparatus, with a resultant improvement in economy and operation.

Experiments are being conducted on all sides to develop high tension apparatus, and voltages are now used which a few years ago were considered impossible. These results are accomplished by means of machines with stationary armature and revolving fields.

Wireless telegraphy is attracting considerable attention as a result of the experiments of Signor Marconi, in England, who has succeeded in transmitting messages without wires as far as 18 miles. Indications are that this system as it is, or in a modified form, will be largely used in the future for the prevention of collisions at sea and for light-house signaling purposes. (See PHYSICS.)

The manufacture of telephones and telephone apparatus is assuming large proportions and the establishing of independent telephone exchanges with low rates is booming this industry. Nothing radical can, however, be reported for the year.

Calcium carbide, the manufacture of which was only a few years ago an experiment, has grown to proportions which entitle it to recognition as a staple manufacture. Its increased use has followed close upon the rapid introduction of reliable apparatus for the production and use of acetylene gas.

In practically all branches of the manufacturing industry the same story of larger output and bright prospects is repeated, so much so that 1898 may be classed in all industrial respects an unprecedented year. Some of this is undoubtedly due to the war with Spain, which naturally distributed large orders for certain materials. Allowing for this there still remains a remarkable manufacturing year to look back upon.

MANUSCRIPT SOCIETY OF NEW YORK, organized in 1889, to perform the unpublished works of American composers, has 550 members. President, Reginald De Koven; Secretary, L. G. Chaffin, Potter Building, New York.

MARBLE. See BUILDING STONES.

MARCHAND, MAJOR. See EGYPT and FRANCE.

MARCHESI, BLANCHE, singer, born in Paris, France, April 4, 1864. She is the daughter of Salvatore Castrone and Matilda Marchesi. After her education in private schools in Vienna and Paris she studied singing with her mother and made her debut in Berlin in 1895. She has sung in many cities of Europe and made her first appearance in America in the season of 1898. She received a diamond jubilee commemoration medal from Queen Victoria in 1897.

MARCOU, JULES, French geologist, died April 18, 1898. He was born in Salins, France, in 1824, and was educated in Paris. He made extensive geological investigations in the Alps, in California, the Rocky Mountain region of the United States and Canada, and other parts of America. He became professor of geology at Zurich in 1855. His geological publications were numerous, those treating of the Rocky mountains and California being considered among the highest authorities.

MARGUERITTE, PAUL and VICTOR. See FRENCH LITERATURE (paragraph Fiction).

MARINE BIOLOGICAL ASSOCIATION (Woods Holl). See ZOOLOGICAL STATIONS (paragraph American Stations).

MARKE, HENRY STACY, R. A., English artist, died January 10, 1898. He was born in London, September 13, 1829; was educated at Leigh's Academy, Newman street; began to exhibit at the Royal Academy in 1853. He was elected an asso-

ciate of the Royal Academy in 1871 and in 1878 became an Academician. He published *Pen and Pencil Sketches*. Mr. Marks's ability was best shown in genre and quaint studies of mediaevalism. Among his best known paintings are, "Dogberry's Charge to the Watch," "Toothache in the Middle Ages," "The Bookworm," "The Spider and the Fly," "Dominicans in Feathers," "St. Francis Preaching to the Birds," "A Good Story," "A Delicate Question," "The Old Tortoise."

MARS. See ASTRONOMICAL PROGRESS.

MARS' ATMOSPHERE. See PHYSICS (paragraph Planetary Atmospheres).

MARTINIQUE, a French colony east of the Caribbean sea, has an area of 381 square miles and a population of about 187,700. It comprises 32 communes and is administered by a governor, who is assisted by a general council (elective) and municipal councils. The colony is represented by a senator and two deputies. The principal town is St. Pierre (pop. about 25,400). The budget for 1897 was 5,369,000 francs (\$1,036,217), and the expenditure of France, according to the budget of 1898, 2,638,000 francs (\$509,134). There is an annuity debt of 95,000 francs (\$18,334). Besides 38 primary schools with over 10,300 pupils there are 3 secondary schools with nearly 500 pupils, a normal school, a law school at Fort-de-France with about 80 students, and 13 denominational and private schools. There are many kinds of agricultural produce, the chief crops being sugar, coffee, cacao, tobacco, and cotton. In 1896 34,429 tons of sugar were exported and 3,765,000 gallons of rum and other distilled liquors; the total exports for this year were valued at 21,431,026 francs (\$4,136,188), and the imports at 22,885,505 francs (\$4,416,902).

MARYLAND, a Middle Atlantic State, with an area of 12,210 sq. m. Capital, Annapolis.

Botany.—For the first time in the history of the State a thorough botanical survey of Maryland is being made under the direction of the State Geological Survey. A preliminary examination of certain portions of the State was completed in the summer of 1898 by Profs. Bassil Sollers and B. W. Barton. The immediate purpose of the survey is to make a list of plants growing in the State, to study them as to their distribution and economic value, and to investigate the poisonous plants and weeds. Incidentally the economic grasses and forest growths will receive attention.

Mineralogy.—During the calendar year 1897, Maryland had its largest output of coal on local record, 4,442,128 short tons, spot value, \$3,363,996. Mining was confined to Allegany and Garrett counties, the former producing the largest amount. The clay industry yielded \$1,302,282, principally in brick and tile, and the quarries produced granite, slate, marble, and limestone to the value of \$613,524.

Agriculture.—The State has made a notable advance in most of its farm products. The following shows the production and value of the principal crops in the calendar year 1898: corn, 18,165,985 bushels, value \$6,357,395; wheat, 11,739,935, \$8,217,954; oats, 1,527,552, \$442,984; rye, 389,252, \$210,196; buckwheat, 92,549, \$49,051; potatoes, 1,274,434, \$675,450; and hay, 353,740 tons, \$3,289,782—total value, \$19,242,812. Live-stock comprised, horses, 129,662; mules, 12,638; milch cows, 155,022; other cattle, 105,900; sheep, 136,135; and swine, 331,853—total head, 871,210.

Manufactures, etc.—In the fiscal year ending June 30, 1898, the tobacco industry yielded 212,874,999 cigars, 350,100 cigarettes, 232,712 pounds of fine cut, 9,953,680 pounds of smoking tobacco, and 750,075 pounds of snuff. There were 45 grain and fruit distilleries in operation; production 2,264,819 gallons, principally rye whiskey and neutral spirits. The production of fermented liquors was 981,978 barrels. Cotton mills have increased their spindle power to 163,740. Under the direction of the U. S. and State Fish Commissions the propagation of food fish is increasing rapidly. More shad, perch, brook trout, rainbow trout, and bass were hatched and distributed during 1897 than in any previous year in the life of the State Commission. German carp has not proved satisfactory, and hereafter bass will be substituted for it in propagating work.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise at the port of Baltimore amounted in value to \$8,907,118; exports, \$118,845,580, a decrease in imports in a year of \$2,464,075 and an increase in exports of \$33,152,929. The trade in gold and silver was: Imports, \$43,717; exports, \$4,739; making the total foreign trade, \$127,801,154.

Banks.—On Oct. 31, 1898, there were 70 national banks in operation and 3 in liquidation. The active capital aggregated \$17,046,320; circulation, \$5,312,990; deposits, \$44,197,381; reserve, \$13,062,702. There were also 12 State banks, with aggregate capital, \$646,250; deposits, \$1,295,085; resources, \$2,161,880; surplus and undivided profits, \$142,055; 3 loan and trust companies, with capital, \$1,600,000; deposits, \$2,092,675; resources, \$6,077,549; 7 private banks, with capital, \$261,420; deposits, \$415,682; resources, \$717,128; and 26 mutual savings banks, with depositors, 168,830; deposits, \$54,769,195; resources, \$57,022,790. The exchanges of the U. S. clearing-

house at Baltimore in the year ending September 30, 1898, aggregated \$888,166,431, an increase of \$125,076,456 in a year.

Transportation.—In November 1898, the Board of Public Works decided to sell all the interest of the State in the Chesapeake and Ohio canal, then in the hands of receivers. This interest has cost the State in one way or another about \$25,000,000, and the object of the sale was to enable the Baltimore and Ohio Railroad Company to obtain a title to the property so as to use it in connection with its reorganized system.

Education.—At the end of the school-year 1896-7, the number of persons of school age was estimated at 345,200, of whom 229,947 were enrolled in the public schools, and 133,627 were in daily attendance. The percentage of enrollment by races was, white, 59.66; colored, 51.50. There were 4,836 teachers; 2,955 school houses; public school property valued (1894) at \$4,350,000; expenditures, \$2,594,702, including \$1,932,512 for teachers' salaries. The public high schools numbered 41; private secondary schools, 43; public normal schools, 2; private normal schools, 3; colleges and universities, coeducational and for men only, 10, with 190 professors and instructors, 1,642 students, and \$333,253 income; colleges for women, 5, with 95 instructors, 523 students, and \$126,900 income; and schools of theology, 5; law, 2; and medicine, 7. The State Agricultural College at College Park, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 208 periodicals of which 16 were dailies, 147 weeklies, and 34 monthlies.

Finances.—The treasury receipts in the year ending Sept. 30, 1897, were \$2,772,055; expenditures, \$2,980,960; cash balance, \$707,138; total funded debt, \$9,284,986; sinking funds, \$6,335,908; net debt, \$2,949,078, offset by unproductive stocks, \$8,129,626, and amount due from accounting offices and incorporated institutions, \$821,914. The assessed valuations under the new assessment law aggregated \$607,965,272, an increase in a year of \$67,503,525, and the tax levy for State purposes was \$1,079,138.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 1,220,000. Local estimates gave Baltimore 625,270.

Events of the Year.—As a result of the elections all the officers of the State remained Republican and the controlling vote in the legislature was Republican. The principal legislation of the year 1898 was for the creation and support of public libraries. Among others, a law was passed for their establishment by any municipality incorporated under the laws of the State; and the governing board of such municipality receives authority to levy a small tax for the purpose, provided that such action be ratified by the voters of the municipality at the next municipal election, after due notice. After a remarkable contest Judge Louis E. McComas, of the Supreme Court, was elected by the legislature a U. S. Senator (Rep.), to succeed, on March 4, 1899, the Hon. A. P. Gorman (Dem.).

National Representatives and State Officers.—The six Representatives from Maryland are: John Walter Smith (Dem.), from Snow Hill; William B. Baker (Rep.), from Aberdeen; Frank C. Wachter (Rep.), from Baltimore; James W. Denny (Dem.), from Baltimore; Sydney E. Mudd (Rep.), from Laplata, and George A. Pearre (Rep.), from Cumberland. Senators: Louis E. McComas (Rep.), from Laurel, and George L. Wellington (Rep.), from Cumberland. Officials (1899): Lloyd Lownes, Governor; Richard Dallam, Secretary; P. L. Goldsborough, Comptroller; T. J. Shryock, Treasurer; L. A. Wilmer, Adjutant-General; H. M. Claybaugh, Attorney-General; E. B. Prettyman, Superintendent of Education; and F. Albert Kurtz, Commissioner of Insurance. All are Republican. Chief Justice, James McSherry (Dem.); Associates, David Fowler, (Dem.); A. Hunter Boyd, (Dem.); Henry Page, (Dem.); Charles B. Roberts, (Dem.); John P. Briscoe, (Dem.); S. D. Schoneker, (Rep.), and James A. Pearce, (Dem.); and Clerk, Allan Rutherford, (Rep.). The State legislature is composed of 50 Democrats and 67 Republicans.

MASCAGNI, PIETRO, composer, born in Leghorn, Sept. 7, 1863. His father was a baker. After receiving his education at the Milan Conservatory, he settled in Cerignola, where he wrote the *Cavalleria Rusticana* in competition for a prize, which he won. This opera, represented in 1890, brought him fame, and was followed by *L'Amico Fritz* (1891); *Les Rantzau* (1892); *Ratcliff* (1895); and *Iris*, a Japanese opera (1898). Mascagni also wrote a symphony for the Leopardi Centenary in 1898. See MUSIC.

MASON, EDWIN C., brevet Brigadier-General, U. S. A., retired, died in St. Paul, Minnesota, April 30, 1898. He was born in Ohio in 1835; entered the Union service as captain of the Second Ohio Infantry in April 1861, and a month later was commissioned captain in the Seventeenth Regular Infantry. He was successively brevetted for gallantry at Fredericksburg, the Wilderness, and Spottsylvania, being at the close of the war a brigadier-general of volunteers. He was then transferred to the regular army as captain. He served against the Indians in California and Idaho, and was commissioned brevet brigadier-general in 1877 and colonel in 1888. He retired May 31, 1895.

MASSACHUSETTS, a New England State, has an area of 8,315 sq. m. Capital, Boston.

Mineralogy.—The most valuable mineral production is granite, in which the State holds first rank, with an output in 1897 valued at \$1,736,069, an increase in a year of about \$80,000, other quarry products were sandstone, marble, and limestone. The entire quarry industry had an output valued at \$2,136,982, giving the State fifth rank in aggregate value.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 1,563,640 bushels, value \$768,184; oats, 483,872, \$179,035; barley, 41,944, \$27,683; rye, 144,923, \$91,301; buckwheat, 45,080, \$27,499; potatoes, 2,668,955, \$1,681,442; and hay, 855,922 tons, \$10,356,656—total value, \$13,131,800. Live-stock comprised, horses, 63,478; milch cows, 179,791; other cattle, 74,875; sheep, 40,437; and swine, 54,846—total head, 413,427.

Manufactures.—That part of the State census report of 1895 relating to manufactures was issued in 1898. The maximum number of persons so employed was 518,744; minimum, 357,249; average for the year, 432,272. The averages of employment by cities was: Boston, 57,108; Fall River, 28,703; Lowell, 28,260; Worcester, 21,733; Lawrence, 18,497; Lynn, 14,778; New Bedford, 14,382; Holyoke, 12,809; and Cambridge, 12,017. Wage payments aggregated \$192,970,059; average, \$446; and salary payments, \$23,812,542; average, \$1,265. The total capacity of the mechanical power used in the manufacturing and mechanical industries was 676,792 horse power; and the total value of machinery, implements, and tools used was \$178,735,454, of which only \$13,332,778 was of foreign make. The report of the Bureau of Statistics of Labor for 1897 dealt with 77 distinct industries, representing 4,695 establishments. The total capital investment was \$394,371,391, and of the nine leading industries all showed an increase in capital excepting the manufacture of cotton goods. Woolen goods, with 117 establishments, showed the largest gain in capital, \$3,734,987, and cotton goods showed a decrease of \$1,905,707. The value of all goods manufactured was \$576,877,064, a gain of \$16,996,553 in a year. Of this total \$330,364,831 was represented by six industries, viz.: boots and shoes, \$99,773,896; woolen goods, \$25,599,328; worsted goods, \$24,111,098; leather, \$21,837,377; paper, \$19,933,033; and carpetings, \$6,364,700.

Commerce.—During the fiscal year ending June 30, 1898, the imports of merchandise at the various ports had a value of \$51,620,074; exports from Boston and Gloucester, \$117,535,362—a decrease in a year in imports of \$39,328,510, and an increase in exports of \$16,668,620. The movement of gold and silver was, imports, \$653,740; exports, 8,100; making the total foreign trade of the year \$169,817,276.

Banks and Insurance.—On Oct. 31, 1898, there were 262 national banks in operation and 26 in liquidation. The active capital aggregated \$90,777,500; circulation, \$30,133,400; deposits, \$261,254,246; reserve, \$82,384,046. There were 34 loan and trust companies, with capital, \$11,375,000; deposits, \$99,429,249; resources, \$134,294,237; 187 mutual savings banks (Oct. 30, 1897), with depositors, 1,384,329; deposits, \$473,919,094; resources, \$503,973,935; and 121 co-operative banks, working under State incorporation and with constantly varying assets. The exchanges at the U. S. clearing-houses at Boston, Springfield, Worcester, Lowell, New Bedford, and Fall River, in the year ending Sept. 30, 1898, aggregated \$5,509,726,863, a net increase in a year of \$116,829,094. Of insurance companies operating under State charters, there were 6 doing life business; 51 (46 mutual, 5 stock) doing fire business; 3 doing marine business; 11 doing assessment life and casualty business; and 6 engaged on miscellaneous lines; in all 77 home corporations.

Transportation.—In 1898, 12 corporations operated 48 steam railroads and their branches in the State. The total mileage of the roads was 4,755.69, of which 2,128.87 were within the State; capital stock, \$145,531,200; cost of construction, \$184,085,643; net income, \$16,168,689. There were also (Sept. 30, 1897) 93 street railway companies, capitalized at \$32,670,272, which had paid \$32,167,859 for construction and \$13,251,397 for equipment. During the year the roads carried a total of 308,684,224 passengers. See BICYCLE PATHS.

Education.—At the end of the school-year 1896-7, there were 439,367 pupils enrolled in the public schools, of whom 334,945 were in daily attendance. There were 4,501 public schools; 12,843 teachers; public school property valued at \$36,780,727; and expenditures, \$12,390,618, including \$7,032,812 for teachers' salaries. Advanced institutions comprised 225 public high schools, with 1,260 teachers and 31,360 pupils; 97 private secondary schools, with 649 teachers and 5,459 pupils; 9 public and 3 private normal schools; 9 colleges and universities, co-educational and for men only, with 390 professors and instructors, 4,831 students, and \$1,660,218 income; 5 colleges for women, with 300 instructors, 2,484 students, and \$620,866 income; 3 schools of technology; 8 theological, 2 law, and 4 medical schools; and 12 summer schools. Both the Massachusetts Institute of Technology and the Massachusetts Agricultural College, through State legislation, share in unequal parts the annual Federal appropria-

tion to promote agriculture and the mechanic arts, which was \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 616 periodicals, of which 84 were dailies, 315 weeklies, and 170 monthlies.

Churches.—Local reports in 1898 gave the following denominational figures: Advent, 50 churches, 3,500 members; Baptist, 335 churches, 293 ministers, 69,851 members; Congregational, 598 churches, 788 ministers, 112,961 members; Free Baptist, 16 churches, 2,822 members; Methodist Episcopal, 370 churches, 64,429 members; Protestant Episcopal, 208 parishes, 253 clergy, 36,512 communicants; Roman Catholic, 395 churches, 659 clergy, 880,000 estimated Roman Catholic population; Swedenborgian, 19 churches, 1,849 members; and Universalists, 124 parishes, with about 10,000 families.

Finances.—On June 1, 1898, the total funded debt was \$51,563,729; sinking funds and other assets, \$13,889,893—net debt, \$37,673,836, a net increase of nearly \$10,500,000 in a year. Included in the funded debt is a contingent debt, incurred in behalf of cities and towns which will ultimately be repaid to the State. Deducting the contingent debt, sinking funds, and other assets from the gross debt, left the net State debt proper \$12,462,378 on Jan. 1, 1898, and \$13,598,964 on Jan. 1, 1899. The assessed valuations for 1897 were, real estate, \$2,117,888,637; personal property, \$1,340,093,517—total, \$3,457,982,154.

Population.—The local census of 1895 gave the State a population of 2,500,183, and Boston, 496,920; Worcester, 98,767; Fall River, 89,203; Lowell, 84,367; Cambridge, 81,643; Lynn, 62,354; New Bedford, 55,251; Somerville, 52,200; Lawrence, 52,164; Springfield, 51,522; and all other cities and towns less than 50,000 each. The Federal estimate for the State on June 30, 1898, was about 2,678,000.

Elections and Legislation.—The elections of 1898 showed Massachusetts to be Republican, although there was some decrease in the Republican vote. Gov. Wolcott was re-elected for his fourth term with a plurality of 83,186 votes. The Republicans lost two Congressmen, and, therefore, Massachusetts has a larger Democratic representation than it has had since 1892. The Democrats gained several seats in the State Legislature.

The Legislature passed a bill on June 23, providing for a Massachusetts War Loan of \$1,500,000 the bonds to run for 30 years, interest not exceeding 4 per cent. payable semi-annually. The sum was apportioned to pay bounties authorized for volunteers and pensions to the families of the enlisted men. A bill was also signed by the Governor appropriating \$50,000 for a hospital ship.

A new statute passed in 1898 is considered one of the most revolutionary measures passed by the Legislature for many years. It provides that if a certain number of real estate owners, who have paid taxes for a year prior to the petition in a town, city, or county, shall present a petition to a justice of the Superior Court, alleging that "they believe, and have reason to believe, that the moneys of such city, town, or county are being unlawfully or corruptly expended," and desire an investigation of this expenditure, "it shall be the duty of the justice to make summary investigation into the affairs of such city, town, or county," and he "may appoint experts to examine the books and accounts of the officials under investigation." Another law provides that "When a city, or town, or any of its officers or agents, are about to raise or expend money for any purpose or object, or in any manner other than those for and in which such city or town has the legal and constitutional right and power to raise and expend money or incur obligations, ten taxable inhabitants may go to the court and obtain an injunction or such order as may be necessary." This act, really an extension of an old statute, gives to taxpayers a larger protection against misgovernment and corrupt officials than they have heretofore had in Massachusetts.

Legislation affecting public charity had been recommended by a recent commission, in 1898, accordingly, a State Board of Insanity was created. It consists of five persons, two at least of whom must be experts. It must appoint an executive officer, who is a physician and an expert in insanity. It must present annual reports of the institutions under its supervision, including "information embodying the experience of this and other countries regarding the best and most successful methods of caring for such persons as come under its supervision; and it shall also encourage scientific investigation by the medical staffs of the various institutions under its supervision; and shall publish from time to time bulletins and reports of the scientific and clinical work done therein." On the first Wednesday in 1900 it is to report to the Legislature what "methods in its opinion will most effectually provide for the care and support of the insane poor, who, under existing laws, are cared for or supported at the expense of the cities and towns of the Commonwealth."

In view of this question it is worth while noting that in October 1898, the visible insane in the State numbered 7,886, and those in the hospitals and asylums aggregated 6,865—nearly two and a half times as many as in 1878, since which date the population has only increased fifty per cent. The actual increase of the visible insane during the year,—notwithstanding 311

removals, 435 recoveries, and 630 deaths—1,376 in all—was 397. This shows that 1,775 new cases must have arisen in Massachusetts during the year.

Other provisions of the bill are: Authority to exercise the powers of boards of trustees in managing institutions when so directed by the Governor; inspecting and approving all plans for new buildings (no expenditure of over \$2,000 to be made for alterations or extensions of buildings without the Board's approval); authority to act as commissioners of insanity under certain conditions either in the case of persons inside or outside of institutions; visitations of institutions and records of such visits; prescribing a uniform system of bookkeeping for the various institutions; prescribing the form of certificate used in commitments; arrangement for semi-annual conferences between the Board and the trustees of the State institutions.

On Oct. 1, 1898, the Torrens' system of State insurance of land titles went into effect. It had been first proposed by Governor Russell in 1891, but was not passed till 1898. The appropriation for this new Court of Land Registration for 1899 is \$33,925, to cover lawyer's fees for examining titles, and all other official expenses. The fees for registration of land amount to \$33.25, and in addition there is the main fee of two-tenths of one per cent. of the value of the property. The property once insured is always insured, but on change of ownership a small fee must be paid for the new certificate.

Of the other acts passed by the Legislature in 1898, the most important were:—For the reclamation of waste and unused land with the labor of prisoners from jails and houses of correction; modifying divorce procedure and, in suits on the ground of adultery, permitting the person alleged to be *particeps criminis* with the defendant to appear and contest the suit; providing for entry for breach of conditions in deeds of land and for making and recording a certificate of such entry to be *prima facie* evidence of breach and entry; codifying the State election laws, including elaborate provisions in regard to political committees, caucuses, and primaries; regulating the employment of the labor of children and their education.

In 1896 the national conference of commissioners on uniform legislation recommended for adoption by the various States a uniform negotiable instruments law. Massachusetts adopted this act during the past year. Towns and cities were also empowered to lay out bicycle paths. Massachusetts also made a serious attempt to reform the present unsatisfactory system of assessing the general property tax. The State Tax Commissioner has been authorized to appoint a deputy who may visit any city or town and inspect the work of its assessors and require of them such action as will tend to secure uniformity in assessments throughout the Commonwealth.

In April a law was passed substituting the electric chair for the gallows and, in order to avoid the necessity of more than one electric plant for the purpose, all executions are to take place in the State prison. The old publicity is also done away with, as nobody is allowed to be present except certain officials, including the necessary physicians, the Surgeon-General of the Governor's staff, and the Sheriff of the county in which the crime was committed, and not more than three other persons.

An important measure was adopted in 1898 relating to street railways. This does not go to the length of absolute public control, but still proceeds upon the principle that the public has paramount rights over the movements of transportation in its cities. It centralized the supervision of street railways to some extent by introducing State control at certain points, although the local authorities are in the main responsible. It provides that if ten property owners along a proposed route oppose a franchise appeal may be had to the State Railway Commissioners. The approval of the latter is also a necessity for the ratification of franchises by the local authorities, and they have power to reduce rates of fare upon petition of the localities. The duty of keeping the pavements between the tracks clean and in repair is removed from the street railways to the city government, the former, however, being required to pay a tax in compensation. The principle of limitation of profits has also been applied since besides the regular corporation tax and the local tax just mentioned, the street railway must pay to the State the excess over dividends of eight per cent. provided the dividends have averaged at least six per cent. since organization.

The State was quiet all through 1898, with the exception of the strike at New Bedford, which began in January and ended in April. The loss was estimated at \$1,500,000. See STRIKES AND LOCKOUTS.

National Representatives and State Officers.—The Representatives from Massachusetts are: George P. Lawrence (Rep.), from North Adams; Frederick H. Gillett (Rep.), from Springfield; John R. Thayer (Dem.), from Worcester; George W. Weymouth (Rep.), from Fitchburg; William S. Knox (Rep.), from Lawrence; W. H. Moody (Rep.), from Haverhill; Ernest W. Roberts (Rep.), from Chelsea; Samuel W. McCall (Rep.), from Winchester; John F. Fitzgerald (Dem.), from Boston; Henry F. Naphen (Dem.), from Boston; Charles F. Sprague (Rep.), from Brookline; William C. Lovering (Rep.), from Taunton; and William S. Greene (Rep.), from Fall River. Senators: George F. Hoar (Rep.), from Worcester; and Henry C. Lodge (Rep.), from Nahant. Roger Wolcott, Governor; W. M. Crane, Lieu-

tenant-Governor; W. M. Olin, Secretary; E. P. Shaw, Treasurer; John W. Kimball, Auditor; Samuel Dalton, Adjutant-General; H. M. Knowlton, Attorney-General; Frank A. Hill, Secretary of the Board of Education; W. R. Sessions, Secretary of the Board of Agriculture; and F. L. Cutting, Insurance Commissioner. All are Republicans. Chief-Justice, Walbridge A. Field; Associates, Oliver Wendell Holmes, Marcus P. Knowlton, James M. Morton, John Lathrop, James M. Barker, and John W. Hammond; and Clerk, Henry A. Clapp. The State Legislature consists of 118 Republicans, 72 Democrats, and 10 Independents.

MASSIE, ADMIRAL THOMAS LEAKE, known as the "Father of the British Navy," died July 20, 1898. He was born in 1802 and entered the navy at sixteen; became commander, 1838; captain, 1841; admiral, 1872. Admiral Massie served at Navarino, Beyrout, Sidon, St. Jean d'Acre, and in the China and Black seas. His home was in Chester, England.

MATHEMATICAL SOCIETY, AMERICAN, organized in 1894, consists of 320 members. It was an outgrowth of the New York Mathematical Society. President, Simon Newcomb; secretary, F. N. Cole, Columbia University, New York.

MATHEE, MARGARET, American actress, died during a performance of *Cymbeline* at Charleston, West Virginia, April 7, 1898. She was born in 1861, according to some authorities, at Tilbury, Ontario, according to others, at Detroit, Michigan. She was married twice, first to Emil Haberkorn, and second, becoming divorced, to Gustave Pabst, of Milwaukee, from whom also she was divorced in 1896. Among her most successful rôles were "Juliet," "Imogen," and "Joan of Arc."

MATTER. See PHYSICS (paragraphs Potential Matter and Vortex Motion).

MATTHEWS, CLAUDE, ex-Governor of Indiana, died in Indianapolis, August 28, 1898. He was born in Bath county, Kentucky, December 14, 1845. In 1877 was elected to the legislature as a Democrat, and Secretary of State in 1890; two years later he was elected Governor by the anti-Cleveland Democrats.

MAUREL, VICTOR, opera singer, born in Marseilles, June 17, 1848. He is the son of an architect and was educated at the Paris Conservatoire, gaining the first prizes in both singing and opera in 1867. He made his début in the opera as De Nevers in *Les Huguenots* in 1868. In 1869 he sang in Italy and subsequently in St. Petersburg, London, and New York. In 1883 he became director of the Théâtre Italien, Paris, and selected for his support Patti, Nicolini, Sembrich, Fidès-Devriès, Jean and Edward de Reszké, and Cepeda. Of late years he has spent much time with Verdi who wrote the parts of Iago and Falstaff for him. Maurel is acknowledged the greatest baritone actor since Faure, and the greatest interpreter of *Don Juan* which he first played in 1880. He was a member of the Grau Company of 1898-9. See *Maurel Dix ans de Carrier* (Paris, 1897).

MAURITIUS is an island dependency of Great Britain in the Indian Ocean 500 miles east of Madagascar with an area of 705 sq. m. and a population in 1891 of 371,655 (including the military), but according to a later estimate 378,041. The capital is Port Louis with a population of about 60,000. In 1891 nearly two-thirds of the population were Hindoos. The prevailing language is French. The chief exports are unrefined sugar, rum, vanilla, aloe fibre and oil. The administration is in the hands of a governor appointed by the crown and aided by an executive council. There is also a council of government consisting, besides the governor, of 27 members of whom 10 are elected. The following islands are administratively dependent upon Mauritius; the Seychelles, Rodrigues, the St. Brandon islands, the Chagos islands and a number of small groups or detached islands.

MAXWELL, Sir WILLIAM EDWARD, K. C. M. G., governor and commander-in-chief of the Gold Coast, died at sea on his way home to England about December 14, 1897. He was born in 1846; was educated at Repton, and in 1881 became a barrister in the Inner Temple. He entered the Civil Service in the Straits Settlements in 1865, and ten years later served in the Perak expedition. He served in the Council both at Perak and Penang, and from 1892 to 1895 was colonial secretary of the Straits Settlements, and in 1893 governor. In 1895 he became governor of the Gold Coast and the following year accompanied the Coomassi expedition.

MAY, PHIL, artist, born in Leeds, England, April 22, 1864. He is the son of an engineer and was educated in St. George's School, Leeds, after which he spent three years in Australia and travelled in America for the *London Graphic*. He is now on the staff of the latter paper and also of *Punch*. He has published *Parson and the Painter* (1891); *Phil May's Annual* (1892); *Phil May's Sketch Book* (1896); and *Gutter-Snipes* (1898).

MEADE, HON. SIR ROBERT HENRY, K. C. B. (1894), G. C. B. (1897), son of the third Earl of Clanwilliam, was born in 1835 and died in Belfast, Ireland, January 8, 1898. He had been extra groom-in-waiting to the Prince of Wales; from 1877 to the time of his death was register of the Order of St. Michael and St. George; and from 1892 to 1897 was permanent Under-Secretary for the Colonies.

MEASLES. See PUBLIC HEALTH.

MECHANICAL FILTRATION. See WATER PURIFICATION.

MEDAL OF HONOR LEGION, organized in Washington in 1890, is composed of officers and enlisted men of the Union army who were awarded medals for bravery during 1861-65. Veterans of the army have 1,000 of these medals and naval veterans 200. There are 475 members. Commander, Amos J. Cummings; Historian, J. Madison Drake.

MEDICAL ASSOCIATION, AMERICAN, organized in New York May 5, 1840, under the name "National Convention;" reorganized May 1847, under its present title. Delegates are appointed from and by permanently organized State medical societies; county and district medical societies that are recognized as regular by their respective State societies; and from the medical department of the army and navy of the United States and the U. S. marine hospital service. The next annual meeting will be held at Columbus, O., June 6, 1899. President, Joseph M. Matthews, M. D.; secretary, W. B. Atkinson, M. D., Philadelphia, Pa.

MEDICAL EDITORS' ASSOCIATION, AMERICAN, organized in 1876. Next annual meeting at Washington, D. C., in June, 1899. President, T. W. Hawkins, M. D., Denver, Colo.; secretary, Dillon Brown, M. D., 40 E. 57th st., New York City.

MEDICAL TEMPERANCE ASSOCIATION, AMERICAN. Next annual meeting at Columbus, O., in June, 1899. President, N. S. Davis, M. D., Chicago, Ill.; secretary, T. D. Crothers, M. D., Hartford, Conn.

MEDICINE. See CUBAN FEVER, DIET AND FOOD, DIPHTHERIA, EPIDEMIC INFLUENZA, HEATSTROKE, PUBLIC HEALTH, SERUM THERAPY, SLEEPING SICKNESS, TUBERCULOSIS, VACCINATION, Etc.

MEDICO-PSYCHOLOGICAL ASSOCIATION, AMERICAN, founded in 1844 under the title "Association of Medical Superintendents of American Institutions for the Insane," in Philadelphia; reorganized under the present name in 1892; composed of physicians in the U. S. and Canada who are interested in the care and treatment of the insane. Next annual meeting in New York City, May 10, 1899. President, H. M. Hurd, M. D., Baltimore, Md.; secretary, C. B. Burr, Flint, Mich.

MEIER, HERMANN HEINRICH, founder of the North German Lloyd Steamship Company, died November 18, 1898. He was born at Bremen, Germany, October 16, 1809. He was one of the founders of the Bremen Bank; the steamship company was organized in 1856. He served several times in the Reichstag and for many years was president of the Life-Saving Society of Germany, which voluntarily maintains life-saving stations on the coasts of the Baltic sea and the German ocean.

MELBA, NELLIE (Mrs. Armstrong), opera singer, born in Melbourne, Australia, May 19, 1865. She studied under Mme. Marchesi in Paris and made her debut in *Rigoletto* at the Théâtre de la Monnaie, Brussels, in 1887, and as "Lucia" in London in 1888. For her Bemberg wrote *Elaine*, produced in London in 1892. She first appeared in New York Dec. 4, 1893, in *Lucia di Lammermoor*. She is a great favorite in America. Mme. Melba lives in Paris.

MELINE, FELIX JULES, French statesman, born May 20, 1838, held the office of premier from April 28, 1896, to June 15, 1898. He was prominent in 1898 in connection with the Dreyfus affair (see FRANCE, paragraphs on History), and the weight of his influence was thrown wholly on the side of the opponents of revision. He wished all discussion to be dropped on the ground that the affair was a *chose jugée*. He held that the honor of the generals impeached by Zola was beyond suspicion, and he approved the condemnation of the novelist, declaring that thenceforth there was no "Dreyfus Affair."

MELOS. See ARCHÆOLOGY (paragraph Greece).

MENINGITIS. See PUBLIC HEALTH.

MERCURY'S ATMOSPHERE. See PHYSICS (Planetary Atmospheres).

MERIDIAN PHOTOGRAPHY. See ASTRONOMICAL PROGRESS.

MERRIMAN, HENRY SETON (Hugh S. Scott), author. His novels include *From One Generation to Another* (1892); *The Slave of the Lamp* (1892); *With Edged Tools* (1894); *The Grey Lady* (1895); *In Kedar's Tents* (1897); and *Roden's Corner* (1898).

MERRITT, WESLEY, Major-General, U. S. A., was born in New York City, June 16, 1836. Upon his graduation at West Point in 1860, he entered the service with the rank of brevet second lieutenant. During 1860 and the early part of 1861 he was on duty with his regiment in Utah, but was then called east and subsequently engaged in the Virginia campaigns, and by a most remarkable record for gallantry and meritorious services rose to the rank of brevet major-general. He was one of the three commissioners appointed by General Grant to arrange the terms of capitulation and

receive the surrender of the Army of Northern Virginia. General Merritt was mustered out of the volunteer service in February 1866; in July of that year he was commissioned lieutenant-colonel of the Ninth United States Cavalry; ten years later he became colonel of the Fifth Cavalry, with which regiment he saw much service against the Indians. On September 1, 1882, he was appointed superintendent of the Military Academy at West Point; he was made brigadier-general in 1887, major-general in 1895, and commandant of the Department of the East in 1897. In May 1898, a new military department—that of the Pacific, including the Philippines—was created, and General Merritt was assigned to the command. On the 27th of the month he took charge of the Manila expedition at San Francisco, Major-General Elwell S. Otis being second in command. He left San Francisco June 29. On August 30 he sailed from Manila, bound for Paris, to advise the American members of the Peace Commission. General Merritt is recognized as one of the most efficient officers in the United States army, and is second in rank, being next to Major-General Miles. See SPANISH-AMERICAN WAR.

METALLIC MINERALS, PRODUCTION OF.

	1897.		1898.	
	Quantity.	Value.	Quantity.	Value.
Aluminium, lbs.....	4,000,000	\$1,400,000	5,200,000	\$1,690,000
Antimony, lbs.	1,500,000	107,250	2,200,000	188,298
Copper, lbs.	510,190,719	56,325,055	545,367,793	64,244,326
Gold, oz. F.	2,864,576	59,210,795	3,110,788	64,300,000
Iron, pig, long tons	9,652,680	92,677,312	11,712,903	111,858,254
Lead, short tons	197,718	11,784,093	217,067	16,410,265
Nickel, lbs.	33,700	11,668	33,700	11,121
Platinum, oz. F....	200	3,000	200	.....
Quicksilver flasks G. ...	26,079	991,002	31,000	1,128,400
Silver, oz. F.	56,457,272	33,755,815	6,460,000	37,321,356
Zinc, short tons	100,382	8,271,889	112,334	10,267,327

METAMORPHISM, or METAMORPHIC ROCKS. The metamorphism of rocks denotes the changes which they may undergo through the action of various agents when buried deep in the earth's crust, and are to be distinguished from those of weathering, which take place at or near the surface. The forces of metamorphism are dynamic action, heat and chemical action. It has formerly been the custom, to recognize several different kinds of metamorphism, such as hydro-dynamic, and regional metamorphism, depending on the nature of the force exerted or extent of the rocks affected. Van Hise however points out that such a classification is not satisfactory, because in all varieties of metamorphism, chemical action, heat and dynamic action, all enter as factors, but simply in different degrees. He further points out that in the earth's crust, two physico-chemical zones can be recognized. In the upper one the changes taking place in the rock are those of weathering, and the temperature and pressure are not great; in the lower zone, temperature and pressure, and chemical reactions take place. This latter zone he divides into three sub-zones of deformation, which are based on the fact that the pressure increases with the depth below the surface. These three divisions, are: 1. An upper zone of fracture in which the rocks are broken up by movements along the surface of the zones, but no movement in the zone itself. 2. An intermediate zone of fracture and flowage. 3. A lower zone of flowage in which the mashing or kneading action takes place, which involves every particle of the rock. This flowing of the rock does not indicate that it is in a liquid condition, for the rock during this period of flowing, although moving, at the same time appears like a solid. The flowing action, however, is brought about by the presence of water in the pores of the rock. These waters are continually dissolving particles from points which are under strain and pressure, and depositing material at other points which are not under pressure. The rock under pressure, is therefore moved, particle by particle, and undergoes a recrystallization, but no fracture occurs.

METARGON. In experimenting on liquid air Prof. Ramsay and Mr. Morris Travers believe that they have found a new substance. This is found in liquid argon. When this latter body was obtained in the liquid state the metargon was found in a solid condition. Another gas was also found named by the discoverers "neon." See NEON, KRYPTON, and XENON.

METEOROLOGY. An important event during the year 1898 was the passage of an act of Congress, authorizing the establishment and equipment of meteorological observation stations at such points in the West Indies and on the mainland bordering the Caribbean sea, and on the adjacent islands as might be needed. The object of this is to have daily observations taken of the meteorological phenomena at the sev-

eral stations, in order to disseminate information concerning the approach of tropical hurricanes or other storms to the West Indies or United States. The points selected are Willemstad, Curaçoa; Santiago, Cuba; Kingston, Jamaica; Port of Spain, Trinidad; Santo Domingo, Santo Domingo; St. Thomas; Barranquilla, Colombia, S. A.; Bridgetown, Barbados; St. Christopher; Colon, Colombia, S. A. Kingston is the central station and all the others report daily to it and to Washington. In Alaska a station of the Climate and Crop Service of the Department of Agriculture has been established.

The use of kites for exploration of the air has in the last few years given valuable data, and these have been carried on with increased success during 1898. Since the use of wire and also of improved kites, greatly increased heights have been obtained. The maximum was reached at Blue Hill on Aug. 26, 1898, when five kites with a combined lifting surface of 200 sq. ft., lifted 29,000 ft. of wire weighing 75 lbs., together with the meteorograph, recording barometric pressure, relative humidity, and wind velocity, to a height of 11,144 ft. above Blue Hill. At 11,000 ft. the wind was found to have a velocity of 40 miles per hour, while at the surface it was only 22 miles. Kites are found superior to balloons, and can be used up to an altitude of 2 miles. They are now used at several stations in the United States, also at St. Petersburg, Russia, and near Paris, and their use is contemplated at some of the mountain stations in Europe.

At the eighth meeting of the German Meteorological Society held in Frankfort a. M. Germany, Prof. van Bebbber showed that in an analysis of the duration of sunshine in North America, he found that the amount increases rapidly toward the south, as in Europe, reaching a maximum in Arizona. Like Europe the mountains receive the most morning sunshine, but unlike Europe the northern portion of America receives its greatest amount of sunshine in July, and the South in June.

The *Monthly Weather Review*, issued by the Department of Agriculture, gives for each month the complete meteorological record for the United States, and also includes climatic data from Jamaica, Hawaii, Haiti, Mexico, and in some cases Canada and Nicaragua. See OCEANS.

METEORS. See ASTRONOMICAL PROGRESS.

METER. See WATER-WORKS.

METHODIST CHURCH, FREE, organized in 1860 at Pekin, N. Y., has missions in the West Indies, Japan, India, and Africa. It has two colleges and six seminaries. The college at Greenville, Ind., with which is connected a school of theology is very prosperous. Their official paper, published in Chicago, is widely circulated. The statistics for 1898 give 36 conferences, 28,124 members, with an increase of 2,755 during the quadrennium. Four superintendents and one evangelist constitute the officers of this church.

METHODIST EPISCOPAL CHURCH. This sect stands first in numbers in the United States. The year 1898 was a prosperous one. The Missionary Society's debt of \$186,000 was cancelled; the mission field extended to include Porto Rico; the Church Extension Society aided 406 churches; and the Joint Commission on Federation from the M. E. Church and the M. E. Church, South, met in Washington, D. C., in January. Here resolutions were passed for the preparation of a common catechism, hymn-book, and order of public worship; the regulation of the International Epworth League conventions; co-operation in foreign missions; the joint administration of publishing in China and Japan; co-operation in the work of higher education in 1900 and 1901; and the commendation of the American University in Washington, for special contributions during those years. It was further resolved that no new work should be organized by either church where the other is established, without the consent of the bishop of that special place. The ministers also voted in 1898 in favor of a constitutional change proposed by the Rock River Conference "making the numerical representation of the laity equal to that of the ministry in the General Conference," a change which will probably be adopted at the next session of that body in May 1900. The Board of Bishops convened at Springfield, Mass., and established the "Twentieth Century Thank-Offering," and agreed that \$20,000,000 should be contributed within three years from January 1, 1899. \$10,000,000 for educational institutions, and \$10,000,000 for charitable institutions, and the payment of debts on church property. A General Executive Commission of seven bishops, eight ministers, and fifteen laymen was appointed. The report for 1898 shows 25,371 churches, 16,393 ministers, and 2,705,601 members. The Commissioner of Education's report give 86 institutions for higher education in the United States. with 845 professors, 8,482 students; and an endowment of \$10,403,497. The bishops of the M. E. Church are: Thomas Bowman, St. Louis, Mo.; Randolph S. Foster, Roxbury, Mass.; Stephen M. Merrill, Chicago, Ill.; Edward G. Andrews, New York, N. Y.; Henry W. Warren, University Park; Col.; Cyrus D. Foss, Philadelphia, Pa.; John F. Hurst, Washington, D. C.; William X. Ninde, Detroit, Mich.; John M. Walden, Cincinnati, O.:

Willard F. Mallalieu, Buffalo, N. Y.; Charles H. Fowler, Minneapolis, Minn.; John H. Vincent, Topeka, Kansas; James W. Fitzgerald, New Orleans, La.; Isaac W. Joyce, Chattanooga, Tenn.; John P. Newman, Omaha, Neb.; Daniel A. Goodsell, San Francisco, Cal.; Charles M. McCabe, Fort Worth, Texas; and Earl Cranston, Portland, Ore. Missionary bishops: William Taylor, Viva, Congo, Africa, and James M. Thoburn, Calcutta, India.

METHODIST EPISCOPAL CHURCH, SOUTH. This body reports a successful year. The missionary debt of \$148,000 was cancelled and much attention was paid to the question of missionary work in Cuba. The old question of methods to collect a claim of \$288,000 against the U. S. government for occupancy, use, and damage to their publishing house during the Civil War, was discussed. Mr. Washington Duke gave Trinity College, South Carolina, \$100,000; and the Southwestern University of Georgetown, Texas, had undertaken a new building costing between \$50,000 and \$75,000. The report for 1898 shows 5,901 churches, 13,995 ministers, 1,458,345 members. The next General Conference will be held in 1902. The bishops of the Methodist Episcopal Church, South, are: John C. Keener, New Orleans, La.; A. W. Wilson, Baltimore, Md.; J. C. Cranbury, Ashland, Va.; R. K. Hargrove, Nashville, Tenn.; W. W. Duncan, Spartanburg, S. C.; E. R. Hendrix, Kansas City, Mo.; C. B. Galloway, Jackson, Miss.; J. S. Key, Sherman, Tex.; and O. P. Fitzgerald, Nashville, Tenn.

METHODIST PROTESTANT CHURCH. This organization celebrated on November 14, 1898, the 70th anniversary of its foundation. During the year the Chicago German Conference was organized at Elkhart, Ind., and this sect joined with the United Brethren in establishing the Ohio Valley College at Ravenswood, W. Va. The report of 1898 gives 2,263 churches, 1,588 ministers, 1,196 preachers, and 180,964 members, showing a falling off of nearly 2,000. There were 2,216 Sunday schools, with 18,490 officers and teachers, and 126,183 scholars. The church property was estimated as \$4,829,423. The U. S. Commissioner of Education reports this denomination as having 2 colleges in the United States with 25 instructors, 214 students, and endowment funds of \$85,000.

METROPOLITAN MUSEUM OF ART, organized in 1870, has now 3,500 members. The annual report says that "for the last twenty years the Museum has not incurred any debt for its administration." It gives the number of visitors for 1898 as 511,398, 44,371 less than that of the previous year, largely owing to the inconvenience of entrance caused by the construction of the east wing. A new system of sewerage has been provided which renders the Museum healthful, and work on the east wing was resumed. The new building is half finished and will be completed during the coming year. The number of permits issued to copyists in the department of painting was 471, and 229 were issued in other departments. A model of the much discussed bronze Bacchante by MacMonnies was taken at the request of the French government. The Museum received a number of new gifts and two important bequests which, however, have not yet been delivered. The works of art donated since the last report are: An etching of Benjamin Franklin and 70 bronze medallions by Pierre Jean David d'Angers, given by Samuel P. Avery; 9 Japanese embroideries, by Mrs. Ellen J. Banker; 2 silver medals and plaque by Victor D. Erenner; George Inness's oil painting "Barberini Villa," by Lyman G. Bloomingdale; 226 instruments by Mrs. John Crosby Brown; 19 cases of antiquities from Denderah, by the Egyptian Exploration Fund of London; \$1,000 by the estate of Simon Goldenberg; Eastman Johnson's painting "Two men," by Robert Gordon; Benoni Irwin's Portrait of Mr. Fermham, by Mrs. Benoni Irwin; H. A. Loop's painting "Love's Crown," by Mrs. H. A. Loop; an original drawing of Benjamin Franklin by George A. Lucas; ten bronzes reproductions of Olin L. Warner's works, by the National Sculpture Society; 17 Greek and Etruscan vases; 10 Græco-Roman terra-cotta heads, and one Roman bronze vase, by F. W. Rhinelanders; Henry Mosler's painting, "Brittany Wedding Feast," by Jacob H. Schiff. The Museum acquired by purchase a number of Greek and Roman antiquities; three Egyptian gold plaques, some gold, bronze, terra-cotta, and glass objects found in the Crimea; 3 Tanagra statuettes; and a cameo medallion of George Washington.

The additions to the library were 204 volumes by purchase and 173 volumes by presentation. There are 5,454 volumes, 154 portfolios, and 463 catalogues, pamphlets, etc. Officers of the corporation for 1899-1900: Henry G. Marquand, President; F. W. Rhinelanders and Daniel Huntington, Vice-Presidents; Hiram Hitchcock, Treasurer; Louis P. di Cesnola, Secretary; and William L. Andrews, Honorary Librarian. Officers of the Museum are: Louis P. di Cesnola, Director; George H. Story, Curator of Painting; John A. Paine, Curator of Casts; and P. H. Reynolds, Curator of Sculpture.

MEXICO, a republic of North America, comprises 27 States, 2 Territories, and a federal district, whose aggregate area is 767,005 square miles, and whose population,

according to the census of 1895, is 12,578,861. In 1879 the inhabitants numbered 9,908,011. Of the total number 43 per cent. are mixed races, 38 per cent. Indians and 19 per cent. whites. Of the Indians and mixed races, only a few are civilized. The largest district is Chihuahua, with an area of 87,802 square miles, and the smallest, except the federal district, is Tlaxcala, 1,595 square miles. The most populous State is Jalisco, with 1,107,863 inhabitants, 34.8 to the square mile; the federal district is the most densely populated, with 1,046.7 to the square mile. The territory of Lower California has the fewest inhabitants (42,245) and is the least densely populated, the number per square mile being 0.7. The capital is Mexico (pop. in 1895, 344,377; other important cities are Puebla, 91,917; Leon, 90,978; Vera Cruz, 88,993; Guadalajara, 83,870; San Luis Potosi, 69,676; Monterey, 56,855; Durango, 42,165; Zacatecas, 40,026; Guanajuato, 39,377; Merida, 36,720; Queretaro, 32,790; Oaxaco, 32,641; Morelia, 32,287; Calientes, 31,619; San Juan Bautista, 27,036. Immigration to Mexico is small.

Government.—By the constitution proclaimed in 1857 and subsequently modified, the chief executive authority is vested in a president, chosen for four years by an Electoral College which is selected by popular vote. The president is General Don Porfirio Diaz, who in December, 1896, began his fifth term. The president is assisted by a council and by seven cabinet officers, known as secretaries of State, and in whose hands are the Departments of Foreign Affairs; Interior; Justice and Public Instruction; Fomento, Colonization, and Industry; Communications and Public Works, Public Credit and Finance; War and Marine. The legislative power devolves upon a Congress of two houses, a Senate and a House of Representatives. The members of the former number 56, there being 2 for each State and for the federal district, and they are elected by popular vote. Representatives, elected in the same manner and holding office for two years, are chosen in a proportion of one for each 40,000 inhabitants. The Congress meets each year. Each State elects its legislature and governor under its own constitution and statutes. The judiciary is independent of the executive and, besides the lower courts, is composed of 38 District Courts, 9 Circuit Courts, and the Supreme Court. The last named court consists of 15 judges elected for six years.

Finance.—Receipts and expenditures in Mexican dollars have been for fiscal years:

	1895.	1896.	1897.
Receipts	50,991,560	50,521,470	51,500,629
Expenditures	50,740,976	45,070,123	48,330,505

	1897.		1898.
Revenue (estimated).....	47,220,000	(estimated)	50,325,900
Expenditure (estimated).....	47,554,926	(estimated)	50,410,312

	1899.
Revenue	52,089,485
Expenditure (estimated).....	

(See paragraph on the President's Messages.)

The States and municipalities have their separate budgets. In 1897 the external gold debt was £21,764,380 (\$105,992,630); the external silver debt amounted to 223,000 Mexican dollars. The internal debt is about 78,676,425 Mexican dollars. The total debt amounts to about 15 dollars per capita. In 1891 the fiscal value of property (fiscal value being one-third less than actual value) was reported as 497,865,196 dollars, about 260,550,000 dollars being urban, and about 237,312,000 rural. Mexico has 12 banks. Of these the most important are: The National Bank, paid up capital, 20,000,000 dollars, note issue, 22,400,000 dollars; the Bank of London, paid up capital, 5,299,050 dollars, note issue, 9,900,000 dollars; the Mortgage Bank, paid up capital, 5,000,000. Other banks have been organized to facilitate mining and agricultural operations. There are four mints in the country from which the annual coinage is something more than 25,000,000 dollars. The following coinage in Mexican dollars is for the calendar year 1895: Silver, 24,832,351; gold, 504,193; copper, 34,525. The coinage for the following year was: Silver, 21,092,397; gold, 55,585; copper, 30,750. The Mexican dollar on October 1, 1898, was worth \$0.474 United States currency. Bank notes are the only paper currency. The standard of value in Mexico is silver.

Army and Navy.—In 1897 the army consisted of 32,143 officers and men, of which 22,605 were infantry, cavalry 7,249, artillery 2,289. The war footing is placed at 131,500 men. Men between twenty and fifty years of age are liable to military service. Notwithstanding its long coast line, Mexico has felt no necessity for an extensive navy. There are 2 despatch vessels and 2 unarmed gunboats, all of old build. The government possesses a steel training ship, the *Zaragoza*, of 1,200 tons displace-

ment, which was built in Havre in 1891. In 1897 four gunboats were building, and other vessels, including a number of first-class torpedo boats, have been projected. The complement in 1898 was about 80 officers and 500 men.

Industries.—The chief industries of Mexico are agriculture and mining, but the former is by no means in an advanced condition. The climate and soil are adapted for many varying kinds of produce. The government encourages agriculture by land grants, one-third of such tracts being ceded over to personal ownership. There are 25 agricultural colonies with about 11,000 inhabitants. The principal farm products are rice, maize, wheat, barley, beans, coffee, cacao, and tobacco; considerable attention is also given to cotton, sugar, indigo, vanilla, bananas, and rubber. In central and northern Mexico large tracts of land are used for the raising of cattle, goats, and sheep. The total number of factories for sugar, textiles, brandy, etc., in 1893 was 3,844. The mineral wealth of the country is very great, there being deposits, many of them very rich, of gold, silver, mercury, tin, copper, lead, iron, cobalt, antimony, sulphur, coal, petroleum. In 1894 there were 3,167 mining enterprises, two-thirds of which were owned by Mexicans. For the fiscal year 1897 mineral exports were reported in Mexican dollars as follows: Gold ore and bullion, 6,208,447; silver bullion and Mexican silver coin, 46,716,215; copper, 3,920,201; lead, 2,814,074. Although coal deposits are known to exist in nine of the Mexican States, but few of them are easily accessible because of the lack of railway communication direct from the mines. The San Marcial coal fields in the Yaqui Valley (Sonora) deserve special mention. It is said that they extend over a territory nearly as large as that of the combined coal fields of England, and that they are larger by 108 square miles than all the anthracite basins of Pennsylvania. The coal, the veins of which extend from the summits of Los Bronces to the Yaqui river, is excellent in quality, having from 90 to 92 per cent. of fixed carbon, $3\frac{1}{2}$ to 5 per cent. of volatile combustible matter, and about 5 per cent. of ash. These fields, it is said, "may be destined to revolutionize the fuel trade on the Pacific coast." Early in 1898 preparations were made for founding a Japanese colony in territory near San Benito and adjacent to Guatemala. The area of the land is 100,000 acres and it was purchased by Count Enomoto, ex-Minister of Agriculture of Japan. The chief occupation of the colonists will be coffee cultivation.

Romero's "Mexico and the United States."—In the fall of 1898 there appeared a volume by the late Señor Don Matias Romero, the Mexican Minister at Washington, entitled *Mexico and the United States*, which gave much new information on present conditions of Mexico and from which may be seen the great promise which many of the Mexican industries have. The statements in this paragraph are taken from this publication. In treating of agricultural pursuits, it was stated that although coffee is usually most successfully grown at elevations of from 1,000 to 5,000 feet above the sea, still the Mexican plantations reach almost to the sea level, and the production of coffee in 1896 was 60,000,000 pounds. Sugar cane, which in many sections grows most luxuriantly, can be advantageously cultivated from the sea level to the frost line. Almost all tropical and semi-tropical products may be grown to advantage, but the Mexican low lands are found to be most excellent for the production of India rubber; it is stated that a plantation in Oaxaca promises to yield a net income for twenty-five or thirty years of over \$100,000 per annum. Although about one-half of the cotton used in Mexico is imported, large tracts of the country are well adapted to the production of this staple, and it is likely that with the growth of manufacturing interests Mexico will in the near future export this commodity. At present the most important fibre export is sisal, or henequen, hemp; fortunately this thrives best on what seems to be otherwise barren lands, and its yield is estimated at from 1,000 to 12,000 pounds an acre. It is grown chiefly in Yucatan. Among the other most promising products may be mentioned the mulberry tree, which grows abundantly on the central plateau of the country; here since the wages are low the raw silk industry is very lucrative. Two other products which just at present are of especial importance are the starch plant, or yuca, which produces large and very nutritious tubers and is highly valued by the common people, and the ginger plant, the cultivation of which yields large profits. Hitherto wood has been the chief fuel of the country, but its scarcity in the cities has become very marked, its cost in the City of Mexico being now about \$14.00 a cord. On this account manufactures have obviously been impeded, but the recent discovery of immense coal fields leads one to look for the rapid development of Mexican manufactures. The International Railroad Company is now working a mine at Salinas in the State of Coahuila. Other large fields have been found in Tlaxiaco in the State of Oaxaca, in Sonora, in Michoacan, and in several other districts. The opening up of these mines will doubtless bring about a rapid development in the iron industry, for as is well known, the country is exceedingly rich in iron deposits of the best quality. Since the time of the early Spaniards, it has been known that gold deposits lay in the Sierra Madre ranges, but for recent years the gold output has been small;

authorities believe, however, that on the western side of the Sierra Madre, from Sonora to Oaxaca, there are very rich gold deposits. Unlike the gold mines, the Mexican silver mines have had an immense annual output; this exceeds \$60,000,000 annually and it is said that the aggregate amount of silver coined in Mexico from 1537 to 1896 was \$3,348,125,878. There were in 1895 7,000 miles of railway in Mexico, not including tramways and private lines. The most important of these are the Mexican Central, which is 1,877 miles long, the Mexican National, 1,056 miles, the Mexican International, 658 miles, the Mexican, which connects Vera Cruz with the City of Mexico and is about 300 miles in length, and the line between Monterey and the Gulf, of 400 miles. It is believed that in general the Mexican roads are prosperous, although thirty-eight of them have been subsidized by the government, up to 1896 subsidies amounting to \$100,000,000 having been paid in cash, bonds, or certificates. The telegraph in Mexico was introduced comparatively early, the first line being finished in 1852 by a private company with the assistance of the government. This line connected Vera Cruz and the City of Mexico. Other lines between important places were constructed in 1853, 1865, and 1869. Between this latter year and 1876 several lines were constructed by the State governments of Michoacan, Oaxaca, and Zacatecas, and in 1885 all of the local lines which had been under federal control were given over to the authority of the States, the federal government retaining control of the through lines. According to a report of April 1, 1897, the federal lines aggregated 28,000 miles and the State and private lines 10,000. In 1880 the Mexican Cable Company laid telegraphic cables between Galveston and Tampico, and Coatezacoalcos and Vera Cruz; since this time other cables and telegraphic lines have been constructed. Schools were established soon after the conquest and the University of San Ildefonso, which was founded in 1553 still exists and is known as the National Preparatory School. These early schools developed and achieved considerable reputation. At present the advantages for secondary and higher education are better than those for primary, but recent grants have been made by the government for the elementary schools and in almost all the States primary education is free and nominally compulsory, but the law is not strictly enforced.

Drainage of the City of Mexico.—A drainage system of the City of Mexico, which, though projected some thirty years ago during the reign of Emperor Maximilian, only reached completion on December 25, 1897. This work, the contract for which was signed December 23, 1889, was carried out by Messrs. Pearson & Sons, London, at an approximate cost of \$20,000,000. The city lies 7,350 feet above the sea, but yet was marshy on account of the lakes about it, which are on the same or a little higher level. Chief among these is Lake Texcoco, which, when it rose in the wet season, filled the city sewers with foul water, thus causing febrile diseases. The method employed to correct this evil was to construct a canal forty miles long, reaching from the San Lazaro gate of the city and running past the lakes into a tunnel about seven miles long which goes through the mountains and connects with the Panuco river. In this way several of the lakes were drained dry and the level of Lake Texcoco was lowered several feet; thus an overflow into the city is prevented. Water gates for the purpose of regulation were placed near the San Lazaro gate and at the point of discharge from Lake Texcoco. Under the present system it is still necessary to remove the sewage from within the city by the San Lazaro pumps. It is hoped that soon a new sewerage system will be constructed that will connect directly with the canal, which is low enough to carry off the sewage.

Commerce.—The following figures showing imports and exports in Mexican dollars for fiscal years are taken from the *Statesman's Year Book*:

Years.	Total Imports.	Exports.		
		Merchandise.	Precious Metals.	Total.
1895	34,000,140	38,319,099	52,535,854	90,854,953
1896	42,253,938	40,178,306	64,832,596	105,016,902
1897	42,204,095	45,164,417	66,182,077	111,346,494

The principal exports are silver, gold, henequen hemp, coffee, cattle, hides, woods, vanilla, dyes, and tobacco; among the chief imports are cottons and woollens, iron and machinery.

Shipping and Communications.—In the fiscal year 1895 there entered the Mexican ports 9,575 vessels aggregating 3,428,973 tons, and cleared 9,557 vessels of 3,359,684 tons; during the following year there entered 10,194 vessels of 3,695,485 tons, and cleared 10,234, with a total tonnage of 3,633,476. The railway lines in 1897 were reported to have at total mileage of 7,380, exclusive of 127 miles of tramway. Of the railways about 5,600 miles were built by foreign and about 890 miles by Mexican capital. The total length of telegraph lines in 1897 was stated to be 40,990 miles, of which the government owned 28,120 miles. The telegraph offices numbered about 800. Telephone communications aggregated 7,459 miles. The number of post-offices

in 1897 was 1,625; receipts (Mexican currency), \$1,246,880; expenditures (Mexican currency), \$1,566,212. A number of railroads have been recently completed or are in process of construction; others have been projected, some of which are very promising of success. In 1898 was completed the road running from San Antonio, on the Southern Railroad, to Chilchatla, Oaxaca, a distance of 33½ miles. This road opens up a rich coffee section. By the fall of 1898 twenty miles of the Monte Alto road were finished, and work on the Chihuahua and Pacific Railroad, which was begun March 25, was being vigorously pushed; it was expected that by March 25, 1899, 125 miles of the road would be finished, thus extending it to Guerrero. The entire line will be 375 miles long. On July 16 the extension to Iguala of the Mexico, Cuernavaca and Pacific Railroad was opened. In the same month the track for the Mexican International road between Monterey and Reata was begun to be laid. In the summer a tunnel between Catorce and Potrero was completed and tracks were soon to be laid. Heretofore Catorce, hidden in the mountains of San Luis Potosi, could be reached only on foot or horseback. The most important of the roads projected in 1898, aside from the concessions already mentioned, are as follows: A road from Cordova to Tehuantepec (port); an extension to Rosario of the road projected from Mazatlan; a road from Saltillo, in Coahuila, to Paredon, Trevino, or some other place on the Monterey and Mexican railroad. A concession for building this road was granted by the government to an American company. Other lines were still more recently projected from Mazatlan to Villa Union, in Sinaloa, and from Merida de Tuncas, in Yucatan. From September 1897, to April 1898, there were built 350 kilom. of railroad, and 234 kilom. of tramways. At the latter date the total length of railway lines in the country was 11,364 kilometers.

A contract was made between the government and Messrs. Pearson & Sons, London, leasing to the company the Tehuantepec Railway, the lease, which is to stand for fifty years, going into effect April 1, 1898. The contract provided that the company construct appropriate harbors at both ends of the road, Salina Cruz and Coatzacoalcos, that the road be maintained in good condition, and that at the expiration of the lease it revert to the government; on the other hand the government guaranteed to the company a net profit of 6 per cent. above outlay for improvements, but profits above this must be turned over to the government. A railway concession also made to Messrs. Pearson & Sons together with Señor Pedro M. Armendaria was approved, according to the *Diario Oficial*, by President Diaz on June 4, 1898. Authority was given the company to locate, build, and operate a railroad in the State of Vera Cruz, running either from Acayuacam or Paso de San Juan, which are on the Jutla railroad, to Tuxtla and San Nicholas. If the company so desires, the road may be extended to Alvarado, but the entire line must be finished within ten years. The company is exempted from import tariffs on goods affecting the construction and operation of the road, and will receive large areas of public lands in the States of Vera Cruz, Chiapas, Tabasco, and Oaxaca. The *Diario Oficial* also announced a railway concession dated May 25, 1898, made by the government to John B. Frisbie representing William Stewart & Co. The road is to connect Culiacan, the capital of Sinaloa, with Villa de Tepia in Durango. The company also has an option on the construction of a road from Culiacan to Altata or some neighboring town.

The government made a contract on November 15, 1897, which was afterward ratified by the Congress, with the Mexican Telegraph (Cable) Company. The contract provided that the international telegraph and telephone service of Mexico should be conducted by this company in conjunction with the Western Union Telegraph Company in the United States, and the latter company was allowed to connect its wires with the Mexican wires, which of course are under government control, at Tamaulipas, Ciudad Juarez, Laredo, Nogales, and Chihuahua. The Mexican Company agreed to make the government an annual payment of 15 per cent. of the profits earned through international service, such payment not to be less than \$20,000 (gold). (See paragraph Romero's "Mexico and the United States.")

Religion and Education.—There is no State church in Mexico, and all religions are tolerated, but Roman Catholicism prevails. The Roman Catholic churches number over 10,000 and Protestant churches about 125. The law forbids the acquiring of landed property by any ecclesiastical organization. Education in most of the States is free and compulsory, but hitherto the authorities have been very lax in enforcing the law. Appropriations are often made by the Central government for the maintenance of schools, but primary instruction is largely provided by the municipalities, while many schools are controlled by charitable organizations. There are secondary schools, seminaries, and colleges for higher and professional education. The public institutions (federal and municipal) in 1895 numbered 7,380 primary schools, 34 secondary, 36 professional, the number of instructors, superintendents, etc., being 10,061, and the average attendance of pupils 338,066. Besides these the schools, under private and ecclesiastical control were 2,193 primary, 34 secondary, and 11 professional, the average number of students in attendance being 68,879. In the higher schools there are about 21,000 students. It was reported that the total amount spent

on public schools, Federal, State, and Municipal, in 1895, was \$3,973,737 (Mexican currency). The government maintains a military and a naval college. There are more than a hundred public libraries besides the National Library, which has 159,000 volumes. In 1895 there were 3 meteorological observatories and 24 museums devoted to science and education; there were 456 periodicals, 10 of which were in English and 1 in French. Great numbers of the population can neither read nor write. (See paragraph Romero's "Mexico and the United States.")

HISTORY.

The President's Messages.—The message of President Diaz delivered at the opening session of the Congress, April 1, 1898, touched upon many things of general interest. He reported a commendable progress in the educational institutions and of the elementary schools he said: "The number of the latter has increased considerably, and the total matriculations, without including the reports from the southern district of Lower California, which have not been received, reached the figures of 56,638 pupils. The national schools, almost in their entirety, are abundantly supplied with the necessary furniture and paraphernalia." Agriculture was reported to be in a generally favorable condition and the value of agricultural products for 1896, not including cattle, woods, and fruits, were placed at 221,000,000 pesos. Many concessions had been granted permitting the private use of Federal waters for irrigation and motive power, much work had been done and much was in progress for the improvement of harbors, and since the Congress had last met private patents had been issued for 419,000 hectares of public lands. During the preceding six months the work of the post-office department had greatly increased; the Federal telegraph system had been enlarged and improved, 576 kilometers of new lines having been constructed between September 1897, and the following April. In regard to governmental finance, President Diaz said that no important changes had taken place; he expressed his satisfaction with the existing banking law, and stated that the Republic had thirteen banks of issue in operation, and two great national banks located in the City of Mexico and having many branches throughout the country.

The extension of the Mexican railroads will make possible the greater development of the immense mineral wealth of the country. In this message, April 1, 1898, President Diaz said: "The status of the mining industry of the Republic is satisfactory. During the period covered by this message 957 new grants have been issued, covering 8,297 claims of one hectare each, the grants issued pursuant to the new law in the premises amounting to 7,476, comprising an area of 58,543 hectares (a hectare equals 2.471 acres).

"The exports of minerals continue on the increase, for by the data published up to this time it may be seen that the value of the minerals exported during the months from June to November last reached 39,000,000 pesos in round numbers, as against a little more than 27,000,000 in the same half-year of 1896. In these exports silver figures to the value of 34,000,000 pesos, gold to the value of over 3,000,000 pesos, and lead to the value of 1,200,000 pesos. Antimony and zinc metals also appear among the exports." Smelting exports which may give some idea of the mining industry, were in part as follows, for the fiscal year 1896-97: The central smelter of Aguascalientes received 102,653 metric tons of ore; the Boleo Company (Lower California) treated 171,000 tons of copper; the Great Monterey smelter treated 185,730 tons of ore, and the smelter of San Luis Potosi 57,653 tons; the Velardeña Company (Durango) treated 53,240 tons, and the Mazapil Company (Zacatecas) 15,000 tons of copper and silver ore.

The following statements are taken from the annual message of President Diaz to the Nineteenth Congress at its opening session, September 16, 1898. The number of mining grants issued since the date of his last report was 837, covering an area of 7,820 hectares. This marks not only a great development in the mining industry, but also an increase in the exportation of ore, the total value of mineral products exported being about \$91,250,000, which is \$10,500,000 greater than the figures for the previous year. Silver (silver valuation) amounted to \$16,000,000; copper, \$4,700,000; lead, \$3,000,000. Progress was noted in agriculture, improvements being reported both in the results and in the method of cultivation. During the period covered by the report, vacant and national lands amounting to 380,368 acres were granted and sold as private property. Between April 1898, and the date of the message, 340 kilometres (195 miles) were added to the railways; this addition increased the Mexico, Cuernavaca, and Pacific railroad by 62½ kilom.; the Mexican Central by 60; the Mexican National by 40 kilom., connecting Patscuaro and Uruapam; the International by 25 kilom., connecting Reata and Monterey. Also railway connections between the capitals of Yucatan and Campeche were established and a line inaugurated between the Gonzalez river and San Juan Bautista. The President reported that at this time (September 1898) there were in Mexico 12,403 kilom. (7,706 miles) of railway, including 235 kilom., 700 m., belonging to the federal government. Four new telegraph offices had been opened; the total

number of messages sent in the fiscal year 1897-98 was 2,086,050; during the six months from January to June, 1898, the increase in messages over the same period of the previous year was 24 per cent. The ordinary federal revenues during the fiscal year 1897-98 amounted to \$52,500,000; this is two millions greater than the receipts of the previous year and exceeds the expenditure of that year as shown by the budget appropriations and the later additions.

The Free Zone.—In the summer of 1898 there reached the American State Department a report on la Zona Libre, of which, although it was established years ago by the Mexican government, but little seems generally to be known in the United States. The Free Zone is a strip of territory about twelve and one-half miles wide extending along the northern boundary from the Gulf to the Pacific. Its establishment was a concession to the Rio Grande States, protecting them against smuggling from the United States; for goods imported into the Zone are taxed only 10 per cent. of the regular duty, but when they are sent southward beyond the Zone a tax of 90 per cent. is levied, the two taxes aggregating the fixed Mexican tariff. The population of the Zone is about 100,000 and the principal cities are Matamoras, Camargo, Mier, Guerrero, Laredo Nuevo, Piedras Negras (Diaz), Juarez, and Nogales. There are scarcely any manufacturing industries on account of the American tariff on the one hand and on the other because on goods sent beyond the Zone line into Mexico the regular 90 per cent. import duty must be paid. Many financiers would like to abolish the Free Zone, but most of them do not deem such an action expedient without giving the inhabitants a proper compensation; and upon this they cannot settle.

MICA. The 1897 production was: Sheet mica, 82,676 lbs.; scrap mica, 740 tons. The latter was ground for manufacture into lubricants, wall paper and boiler coverings. North Carolina furnished 80 per cent. of the sheet mica, while smaller producers were New Hampshire, Idaho, Wyoming, and South Dakota.

MICHIGAN, an upper-lake State, with an area of 58,915 sq. m. Capital, Lansing.

Mineralogy.—During the calendar year 1897, the State not only retained its place at the head of the list of iron-ore producers of the country, but had the greatest output in its history, 6,087,463 long tons, valued at \$8,347,615. All of the output excepting 45,866 tons of magnetite was red hematite ore. What is known as the Lake Superior iron district occupies parts of Michigan, Minnesota, and Wisconsin, and has five notable ranges, Marquette, Menominee, Gogebic, Mesaba, and Vermilion. Of the three States Michigan predominates in production, with Minnesota second, but commercially State lines are ignored. The total shipments from all ranges aggregated 12,215,645 tons in 1897 and 13,650,351 in 1898. In copper the State ranked second, with a production of 145,282,059 pounds. The famous Calumet and Hecla group of mines, the richest in the world, yielded 92,475,595 pounds in 1896-7, and 90,388,346 in 1897-8. In salt also the State held second place, with a production by 54 works of 3,993,225 barrels, principally the "common fine" grade, value \$1,253,403. The clay industry yielded \$791,870, principally in brick and tile, a falling off from \$2,254,329 in 1894.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 33,340,604 bushels, value, \$11,335,805; wheat, 34,061,851, \$21,799,535; oats, 27,782,650, \$7,501,316; barley, 1,046,783, \$460,585; rye, 1,498,604, \$644,400; buckwheat, 360,197, \$151,283; potatoes, 14,104,739, \$3,808,280; and hay, 1,936,591 tons, \$13,846,626—total value, \$59,547,850. Live-stock comprised, horses, 410,410; mules, 2,646; milch cows, 459,107; other cattle, 341,535; sheep, 1,396,053; and swine, 735,055—total head, 3,344,806.

Manufactures.—In the fiscal year ending June 30, 1898, the tobacco industry showed the manufacture of 110,632,385 cigars, 177,550 cigarettes, 6,945,137 pounds of plug; 3,938,712 pounds of fine cut; 8,180,575 pounds of smoking; and 52,526 pounds of snuff. Excepting cigars and cigarettes, these manufactures paid a revenue tax of \$1,147,849.

Commerce.—The imports of merchandise at the various ports in the fiscal year ending June 30, 1898, aggregated in value \$5,348,501; exports, \$25,302,851, a decrease in a year in imports and an increase in exports and total trade. The movement of gold and silver was: imports, \$3,431; exports, \$3,000, making the total foreign trade of the year \$30,657,783.

Transportation.—On Jan. 1, 1898, the total mileage of railroads in the State was 7,823, of which 132 miles were constructed during the previous year. The registered tonnage that passed through St. Mary's Falls Canal in 1897 was 17,619,933; value of American craft, \$42,375,700; and of Canadian, \$2,001,400; value of all freight, \$218,235,927; principal items of traffic, wheat, 55,924,302 bushels, iron ore, 10,633,715 net tons; lumber, 805,612,000 B. M. feet, and grain other than wheat, 24,889,688 bushels.

Banks.—On Oct. 31, 1898, there were 82 national banks in operation and 86 in liquidation. The active capital aggregated \$11,995,000; circulation, \$4,651,278; de-

posits, \$50,764,383; reserve, \$15,720,754. The State banks June 1, 1898, numbered 179, and had capital, \$11,940,050; deposits, \$80,275,926; resources, \$101,126,949; private banks, 47, with capital, \$731,942; deposits, \$2,950,608; resources, \$3,888,660. The exchanges at the U. S. clearing houses at Detroit, Bay City, Grand Rapids, and Kalamazoo in the year ending Sept. 30, 1898, aggregated \$416,074,350, an increase in a year of \$62,377,587.

Education.—At the end of the school-year 1896-7, there were 701,234 persons of school age in the State, of whom 491,812 were enrolled in the public schools and 347,219 were in daily attendance. There were 7,917 school houses, 15,601 teachers, public school property valued at \$17,977,447; expenditures, \$6,378,707, including \$4,044,352 for teachers' salaries. The public high schools numbered 285; private secondary schools, 19; public normal schools, 3, and private ones, 4; colleges and universities, co-educational and for men only, 11, with 241 professors and instructors, 3,802 students, and \$576,995 income; schools of technology, 2; and schools of theology, 3; law, 2, and medicine, 5. The State Agricultural College at College Station, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 786 periodicals, of which 70 were dailies, 614 weeklies, and 73 monthlies.

Finances.—The last assessed valuation, made every five years, showed for 1896 a total of \$946,009,941. On July 1, 1898, the bonded debt consisted of \$400,000 in 1898 war bonds, afterward increased by \$100,000 and \$19,000 in past due bonds never presented for payment. The treasury receipts in 1897 were \$3,603,129; disbursements, \$3,731,663; trust fund debt to educational institutions, \$5,811,045; tax levy for 1897, \$2,379,907, and for 1898, \$2,012,227.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 2,385,000. Local estimates gave Detroit, 320,000; Grand Rapids, 100,000; Saginaw, 60,000; Lansing, 19,500; Battle Creek, 18,000; Manistee, 15,760; Alpena, 15,570; and Sault Ste Marie, 10,000.

Legislation, etc.—The first event of interest during 1898 was an extra session of the legislature called in April, as war with Spain appeared imminent. Gov. Pingree recommended an appropriation of \$500,000 as State aid for the war, an increase of the appropriation for the support of the naval reserves, and a provision for increasing the membership of the National Guard. All the bills passed unanimously; and another act suspended legal process for the collection of debts against citizens of Michigan on military service, and exempted their property from execution, levy, seizure, or attachment for debts contracted prior to or during such service, such exemption to continue for a period of six months after such service should cease, except in cases where the statutes of limitations might operate to make such debts or obligations void. Another act provided for submitting to the electorate the question of calling a Constitutional Convention under the provision of the existing Constitution of Michigan, that such questions should be thus submitted in each sixteenth year dating from the year 1866. Not a vote was recorded against either bill. The proposition for a general revision of the State constitution, voted on at the November elections, received a majority of the votes cast on the question, but not a majority of all the votes cast. The constitution provides that "the general revision proposition must receive the votes of a majority of the electors qualified and voting." The elections in Michigan showed that the temper of the State was uncompromisingly Republican. Gov. Pingree's plurality was no less than 75,097, and all the Congressmen elected were Republicans. The vote for State officers gave the Republicans a majority in the State legislature of 108.

National Representatives and State Officers.—The Representatives from Michigan are: John B. Corliss, from Detroit; Henry C. Smith, from Adrian; Washington Gardner, from Albion; Edward L. Hamilton, from Niles; William A. Smith, from Grand Rapids; Samuel W. Smith, from Pontiac; Edgar Weeks, from Mount Clemens; J. W. Fordney, from Saginaw; R. P. Bishop, from Ludington; Rousseau O. Crump, from West Bay City; William S. Mesick, from Mancelona; and Carlos D. Shelden, from Houghton. All are Republican. Senators: Julius C. Burrows (Rep.), from Kalamazoo; and James McMillen (Rep.), from Detroit. State Officers: Hazen S. Pingree, Governor; O. W. Robinson, Lieut.-Governor; J. S. Stearns, Secretary; George A. Steel, Treasurer; Roscoe D. Dix, Auditor; Horace M. Orin, Attorney-General; Jason E. Hammond, Superintendent of Public Instruction; and Milo D. Campbell, Insurance Commissioner; all of whom are Republicans. Chief Justice, Claudius B. Grant; Associates, Robert M. Montgomery, Frank A. Hooker, Joseph B. Moore, and Charles D. Long; and Clerk, Charles C. Hopkins. All are Republicans. The State legislature is composed of 120 Republicans and 12 Democrats.

MICHIGAN, UNIVERSITY OF, at Ann Harbor, Michigan, was opened in 1841, being a part of the educational system of the State and governed by a board of regents. Tuition is free, but small yearly fees are required, these fees being somewhat greater for non-residents of Michigan. The institution is non-sectarian and co-educational. In September 1898, the volumes in the libraries numbered 122,962, an increase for the

year of 9,022. For the year 1897-8 the officers of instruction numbered about 190; the number of students in the several departments was: academic, 1,333; law, 765; medicine, 437; homeopathic medical college, 61; pharmacy, 79; engineering, 277; dentistry, 223; total, deducting for names counted more than once, 3,114. Of this number 1,863 were from Michigan; 673 were women. The total for the preceding year was 2,878; the total number of women was 647. When war broke out with Spain, about 125 students and as many more graduates enlisted. The degrees conferred during the year ending September 30, 1898, numbered 707, and were as follows: B. A., 81; B. S., 97; B. L., 56; Ph. B., 60; C. E., 2; M. A., 15; M. L., 3; M. S., 12; Ph. M., 4; Ph. D., 7; LL. B., 200; LL. M., 4; M. D., 72; M. D. (Homeopathic), 9; D. D. S., 59; D. D. Sc., 2; Phar. Ch., 1; honorary degrees, 4. The president is James B. Angell, LL. D. He was Minister to Turkey, but, on account of his university duties tendered his resignation of that position, to take effect August 15, 1898. During his absence Professor Harry B. Hutchins was acting president. During the year several of the university buildings were considerably enlarged and improved. The receipts and disbursements for the fiscal year ending June 30, 1898, balanced at \$551,471. See ANTHROPOLOGY.

MIDDLETON, Sir FREDERICK DOBSON, Lieutenant-General of the British army (resigned), died in London, January 24, 1898. He was born in Belfast, Ireland, 1825, was graduated from the Royal Military College at Sandhurst, 1842, entered the army and became lieutenant in 1842 and captain in 1852. He saw much service in New Zealand, New South Wales, Burmah, and India, and was decorated with the Victoria Cross for gallantry in the Indian Mutiny (1857-58). He accompanied his regiment to Canada in 1868; became Lieutenant-Colonel in 1869, Colonel in 1875, Major-General in 1885, and Lieutenant-General in 1887. He was Commandant of the Royal Military College at Sandhurst from 1874 to 1884, and in the latter year became Commander-in-Chief of the forces of Canada; in 1885 he suppressed the Riel rebellion, for which he was knighted by the Queen, received a Knight Commandership of St. Michael and St. George and a grant from the Canadian Parliament of \$20,000. He received severe criticism, however, for certain financial transactions, and upon a vote of censure by the Canadian Parliament he resigned his commission (1890). In 1881 he was created a C. B. (military).

MILES, NELSON APPLETON, Major-General commanding the United States army, was born in Massachusetts, August 8, 1839. Upon the outbreak of the Civil War he left a clerkship in Boston and accepted a commission of first lieutenant in the Twenty-Second Massachusetts Volunteers. He saw much hard fighting, serving through most of the Virginia campaigns, was wounded several times and once most severely, and by his gallantry and efficient services won rapid promotion. In May 1864, he was commissioned Brigadier-General and the following December was brevetted Major-General. In October 1865, he was commissioned Major-General of volunteers and the next July became colonel of the Fortieth United States Infantry. In 1880 he was commissioned a Brigadier-General, and in 1890 a Major-General, and in 1895 was appointed by President Cleveland Commander of the United States army, being the first officer not a West Point man to be raised to the position. He has an excellent record as an Indian fighter. In 1897 he published *Personal Recollections* and in 1898 *Military Europe*. During the Spanish-American War General Miles and General Russell A. Alger, Secretary of War, seemed to be at variance regarding the management of the army and the prosecution of the war; and subsequent to the Santiago campaign General Miles openly alleged mismanagement and incompetency in the War Department. Public statements of this kind were frowned upon by the more conservative army officers, but in extenuation it was claimed that the statements had been made for the protection of the rank and file of the army. It was alleged by some, and that at the beginning of the Cuban campaign General Miles did not receive from the department the consideration to which his rank and ability entitled him. General Miles planned and commanded the Porto Rican expedition, and critics have stated that the signal success of the Americans in the island was due in great measure to the foresight and efficiency of the general commanding. See SPANISH-AMERICAN WAR.

MILITARY ORDERS OF FOREIGN WARS, organized in New York in 1894, by veterans and descendants of veterans of one or more foreign wars in which the United States was engaged: The War of the Revolution, the War with Tripoli, the War of 1812, and the Mexican War. The Spanish-American War makes the fifth and all who participated in this war are eligible to membership as veteran companions. The members are companions, veteran companions, or hereditary companions. The National Commandery was instituted March 11, 1896. Commander-General, Major-General Alexander S. Webb; Registrar-General, Rev. Henry N. Wayne; and Historian-General, Capt. H. H. Bellas.

MILITARY ORDER OF THE LOYAL LEGION OF THE UNITED STATES, a society of commissioned officers of the U. S. army and navy who served during the Civil War, was founded in Philadelphia in 1865. The membership descends from father to son. In 1898 there were 20 Commanderies, each representing a State, and having a total membership of 9,071. The Commandery in Chief has 536 members, and held its fourteenth annual meeting in Boston in October 1898. Commander-in-Chief, Rear-Admiral Bancroft Gherardi, U. S. N.; Recorder-in-Chief, Brevet Lieut.-Col. John P. Nicholson. The Commanderies are Pennsylvania, New York, Maine, Massachusetts, California, Wisconsin, Illinois, Colorado, Ohio, Michigan, Minnesota, Oregon, Missouri, Nebraska, Kansas, Iowa, District of Columbia, Indiana, Washington, and Vermont. Headquarters, Philadelphia.

MILK SUPPLY, SANITARY SUPERVISION OF. The most progressive local boards of health are keeping strict watch of the milk supplies of their respective cities. At Montclair, N. J., a suburb of New York with some 13,000 inhabitants, the board requires all milk dealers to register and to furnish lists of their customers twice a year. No milk may be delivered to private consumers except in glass bottles, the use of milk tickets is prohibited, as liable to spread disease. Empty bottles must not be removed from houses containing infectious or contagious diseases until the patients recover, and then the bottles must be removed and sterilized separately. Stringent rules are enforced regarding the feeding and stabling of milch cows, health and cleanliness of dairy attendants, washing and sterilizing of all dairy utensils.

MILLAIS, LADY, died December 23, 1897. She was the widow of the late Sir John Everett Millais, President of the Royal Academy, who died in August 1896. Lady Millais had been the wife of John Ruskin, from whom she was divorced, with his consent, in order to marry Sir John Millais.

MILLER, General MARCUS P., in command of troops in the Philippines, was born in Massachusetts March 27, 1835; was graduated at West Point in 1858, and served in the Civil War in the cavalry campaign, from Winchester to Richmond, and at Dinwiddie Court House; he was three times brevetted for meritorious services. He subsequently was brevetted colonel for gallantry in the campaigns of 1873 and 1877 against the Indians. He was promoted colonel in 1897, and was assigned to the command of the Third Artillery. Before going to Manila he was made a brigadier-general of volunteers.

MINERALOGY. *New Species.*—Descriptions of nine new species have appeared during 1898, viz.: baddeckite, erionite, clinohedrite, kalgoorlite, krennerite, miersite, rhodolite, raspite and tripuhyite.

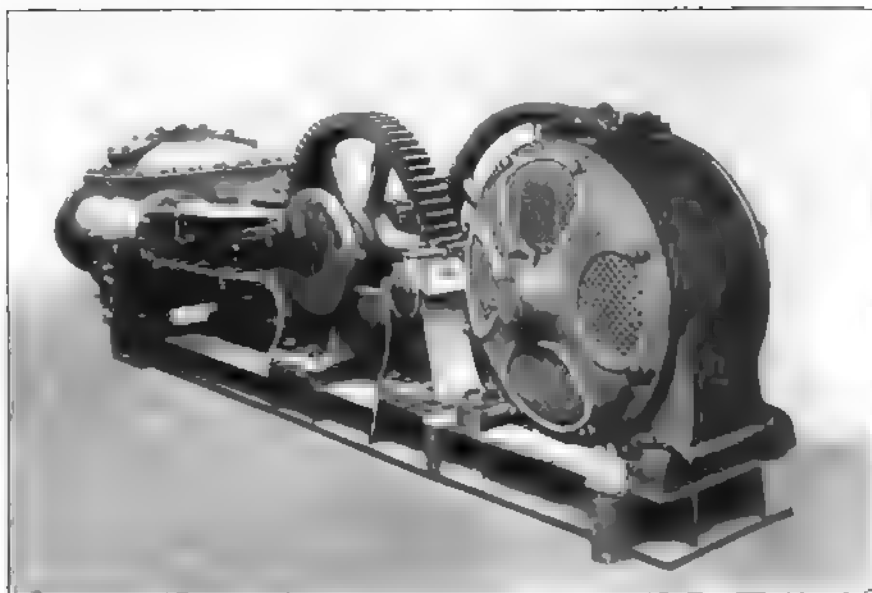
Literature.—E. S. Dana has published a "Textbook of Mineralogy with an extended treatise on Crystallography and Physical Mineralogy," and a new edition of Brush's *Manual of Determinative Mineralogy and Blowpipe Analysis* has also appeared. Among German publications is to be mentioned the first part of Vol. I of Hintze's *Handbuch der Mineralogie*, of which the second volume appeared first. See MINING, the separate articles on minerals, and the articles on countries, and States of the United States.

MINERAL PAINTS. Under this head are grouped iron ores which are ground and used for red and brown pigments, clays (see OCHERS), barites or "heavy spar," slate or shale, soapstone, asbestos, graphite, and gypsum (a pure form). These are all made directly from the pure minerals, but to them should be added, venetian red (from iron sulphate) and zinc white (from zinc oxide). The total production for 1897 amounted to 85,913 short tons, valued at \$2,545,793.

MINERAL WATERS. The United States Geological Survey reports 381 commercial springs for 1897 with a production of 23,255,911 gallons, which is 2,539,401 less than 1896.

MINING. *Production.*—The following table gives the production of minerals in 1897 and in 1898 where the figures for both years are available.

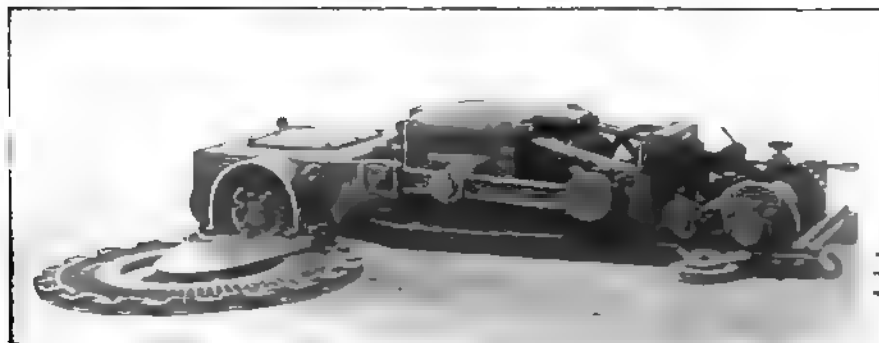
	1897.		1898.	
	Quantity.	Value.	Quantity.	Value.
Non-Metallic.				
Asbestos, short tons.....	770	\$15,400	900	\$18,000
Barites short tons.....	27,316	109,264	30,000	130,928
Bauxite, long tons.....	20,590	41,180	20,000	40,032
Bromine, lbs.	487,149	136,402	491,681	138,276
Coal, anthrac., sh. t.....	52,645,133	85,857,717	49,312,139	84,952,170
Coal, bit., short tons....	147,557,599	120,505,982	158,055,931	125,311,783
Cobalt oxide, lbs.....	19,300	32,810	9,640	16,433
Fluorspar, short tons....	9,025	74,456	8,000	48,000
Graphite, short tons.....	1,200	11,400	1,200	11,360
(Amorphous)				



1

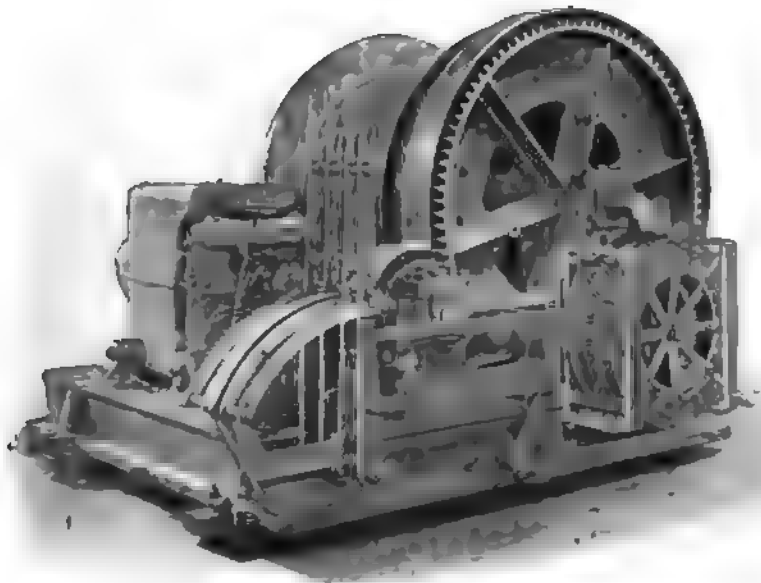


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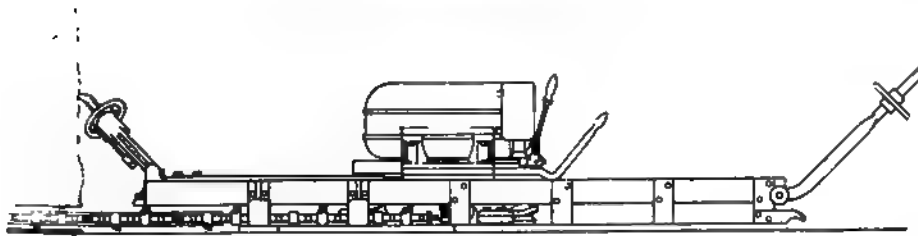


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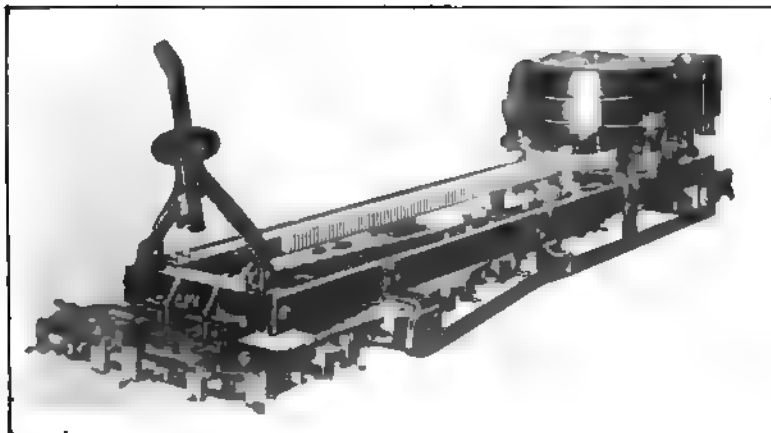
TYPES OF RECENT ELECTRIC MINING MACHINERY.—1. Mine pump operated by machine. 4. Electric drum hoist. 5. Electric coal-cutter; making an



4



5



induction motor. 2. Electric drill—auger type. 3. An electric long-wall coal-cutting
 6. A coal-cutting machine driven by a three-phase induction motor.

Non-Metallic.	1897.		1898.	
	Quantity.	Value.	Quantity.	Value.
Graphite, lbs. (Crystalline)	993,138	\$44,691	1,400,000	\$63,503
Iron ore, long tons.	18,316,967	31,138,844	20,400,788	29,377,135
Limestone flux, long tons	4,247,688	1,868,983	5,154,000	2,319,320
Monazite, lbs.	40,000	2,000	50,000	2,500
Petroleum, bbls.	56,985,643	44,804,962	53,800,000	49,227,000
Phosphate, long tons.	906,080	2,718,240	1,107,513	4,540,369
Pyrites, long tons.	128,468	379,699	185,293	574,401
Sulphur, long tons.	1,690	34,814	2,680	61,640
Zinc White, short tons. .	26,262	1,686,020	32,747	2,226,796

Mechanical Features.—The constant increase in the use of electricity in mining operations has been a noticeable feature of the mechanical progress of the last few years, and there is every indication that it will be used to a greater extent in the near future, owing to the changing over of mines now operated by other forms of power. This is a direct result of the wonderful flexibility of an electric system. Its only rival from the standpoint of convenience, safety or economy is compressed air. Mining operations, especially in the western part of the United States, are usually conducted in regions remote from railways, in sections where transportation is of the crudest and most expensive character, regions which, however, are very often convenient to water power. It is in consequence of this, and the resulting high price of fuel that electric systems have come into general use. It is now customary to locate a generating station where water power can be obtained, and transmit power at high voltages over substantial transmission lines to the mines, where transformers and rotary converters drop the pressure to a safe value. It is then used on the surface to operate mine hoists, pumps, lights and run railways. It is also carried down into the mine, and ramifies throughout the shafts, tunnels and drifts, performing the duties of hauling, lighting, driving pumps, and operating ventilating fans and drills. In the case of coal mining, an electric machine for cutting the coal out at headings has come into general use, to take the place of the old method of picking. It is found that the percentage of lump coal is increased 25 per cent., while the amount of blasting necessary is greatly reduced. One of these cutters will, under favorable conditions, make eight cuts per hour, 36 inches wide and 4 inches high; or it will cut 240 lineal feet in 10 hours.

Two forms of drill are used, the percussion or reciprocating, in which the drill is carried rapidly back and forth, and the rotary or augur drill, which is a long augur driven by an electric motor. For pumping purposes the usual method is to mount some form of reciprocating pump and an electric motor on the same base, and connect these with gearing. Blowers and ventilating fans are operated in a like manner. For operating locomotives a trolley wire is supported against the roof of the tunnels, from which a current is taken by the usual trolley pole. During the past year new drills have been installed in some of the Colorado mines, which give promise of success. The two important mining camps in the West in which electricity is most extensively used as a means of power are Aspen and Cripple Creek. The Portland Gold Mining Co., in the Cripple Creek District, has made arrangements during the past year for lining the long shaft with steel posts instead of timbers. This shaft is about a thousand ft. deep, and it is considered that the use of steel posts, although rather an innovation, will be cheaper in the end. Steel has been very little used elsewhere in this country for underground work, but in Belgium its application for this purpose is not uncommon.

MINNESOTA, a northwestern State of the United States, with an area of 83,365 sq. m. Capital, St. Paul.

Mineralogy.—The State has been a producer of iron ore for about fourteen years only, yet in that time this industry has had a marvelous development in a region previously an unbroken wilderness. During 1897 the State held its rank as second in production, had an output nearly 1,500,000 tons in excess of that of the previous year, and reached its highest record, with 5,601,429 long tons, all red hematite, valued at \$4,029,077. Of the total output, 4,220,151 tons came from mines in the newest developed range, the Mesabi, and the remainder from the Vermilion group. See corresponding paragraph under MICHIGAN.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 30,532,000 bushels, value, \$7,327,680; wheat, 78,417,912, \$42,345,672; oats, 56,298,576, \$11,822,701; barley, 9,160,136, \$3,022,845; rye, 1,182,522, \$449,358; buckwheat, 196,305, \$96,189; potatoes, 9,360,115, \$2,340,029; and hay, 2,754,256, \$10,190,747—total value, \$77,595,221. The State ranked first in production of wheat, second in barley and fourth in oats. Live stock comprised horses, 455,122; mules, 8,416; milch cows, 646,673; other cattle, 570,165; sheep, 410,998, and swine 411,353—total head, 2,502,727.

Manufactures.—Collections of internal revenue on taxable manufactures in the fiscal year ending June 30, 1898, aggregated \$1,209,187. The tobacco industry showed the manufacture of 43,692,497 cigars, 284,955 cigarettes, 5,676 pounds of fine cut, 140,574 pounds of smoking, and 17,127 pounds of snuff. Over 550,000 barrels of fermented liquors were produced. Clay products in 1897 were: brick and tile, \$567,394; pottery of all kinds, \$303,875; and quarrying yielded \$488,366 in granite, sandstone, slate and limestone.

Commerce.—The imports of merchandise in the customs districts of Duluth and Minnesota in the fiscal year ending June 30, 1898, aggregated in value \$2,556,117; exports, \$3,993,225, a decrease in a year in imports and an increase in exports. The total foreign trade was increased \$1,453,811.

Banks.—On Oct. 31, 1898, there were 69 national banks in operation and 41 in liquidation. The active capital aggregated \$12,790,000; circulation, \$2,143,472; deposits, \$41,427,256; reserve, \$16,269,973. State banks, July 14, 1898, numbered 146, and had capital, \$6,266,800; deposits, \$20,356,159; resources, \$29,643,977; loan and trust companies, 8, with capital, \$3,640,026; deposits, \$1,185,469; resources, \$5,723,999; private banks, 39, with capital, \$604,872; deposits, \$2,011,855; resources, \$2,811,119; and stock savings banks (Dec. 31, 1897), 11, with capital, \$200,000; deposits, \$10,463,399; resources, \$10,942,940. The exchanges at the U. S. clearing house at Minneapolis in the year ending Sept. 30, 1898, aggregated \$463,010,490, an increase in a year of \$74,406,952.

Transportation.—On Jan. 1, 1898, the total mileage of railroads in the State was 6,176.76, of which 46.19 miles were constructed during the previous year. The grants of land within the State to railroad companies by Congress and by the State to promote construction have amounted to over 20,000,000 acres, conservatively valued at \$103,000,000. The companies aided by land grants have built 3,200 miles of road.

Education.—At the end of the school-year 1896-7 there were 371,889 pupils enrolled in the public schools, and 235,497 in daily attendance. Teachers numbered 11,238, and school houses 6,953, and the value of public school property was \$15,350,000. The expenditures were \$5,153,190, including \$3,406,580 for teachers' salaries. There were 102 public high schools with 460 teachers and 10,550 pupils; 30 private secondary schools with 159 teachers and 1,594 pupils; 5 public and 2 private normal schools; 9 colleges and universities, co-educational and for men only, with 216 professors and instructors, 2,998 students, and \$396,868 income; a college for women, and 8 theological, 1 law, and 3 medical schools. The University of Minnesota at Minneapolis, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 601 periodicals, of which 38 were dailies, 490 weeklies, and 51 monthlies.

Finances.—The assessed valuations at the close of the biennial period, 1895-97, were: Real estate, \$472,742,654; personal property, \$105,612,716—total, \$584,355,370; total taxes levied, \$14,084,405; State tax rate, \$2.46 per \$1,000. The valuations showed a reduction in real property and an increase in personal. Treasury receipts for 1897-99 were estimated at \$4,997,000; expenditures, \$4,590,000. Legislative appropriations in 1897 aggregated \$1,955,359. The total bonded debt, Sept. 1, 1898, was \$1,419,000, of which \$418,000 was held in State funds.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 1,820,000. Local estimates gave Minneapolis, 192,000; St. Paul, 160,000, and Duluth, 60,000.

History.—The excitement of the year in Minnesota was the outbreak of the Bear Lake Indians. The trouble originated at Leach Lake on account of an attempt to arrest Bush Ear, chief of the band, and compel him to appear as a witness to prosecute a case of alleged illegal selling of whiskey to Indians in his band. He refused, and was, in consequence, arrested. Members of his band rescued him. A battle between the Third U. S. infantry and the Indians occurred at Leach Lake, in which one officer, Major Melville C. Wilkinson, a sergeant, and five privates were killed, and eleven soldiers were wounded. For further details see PILLAGER OUTBREAK.

Another event less exciting, but important, was the laying of the corner stone of the new capitol building in St. Paul. The building will cost \$2,000,000, and is being constructed of granite from St. Cloud and marble from Georgia. Senator Cushman R. Davis delivered the oration. Archbishop Ireland and Bishop Whipple officiated. In the November elections, the Democratic-Populist Governor, John Lind, was elected by a plurality of 20,399 votes, but the Legislature remained Republican. The Governor has been a Republican for fifty years until 1898.

As to legislation, an important act was passed relating to the initiative and referendum. Minnesota did not go to the length of South Dakota (q. v.) in 1898 in the matter, but made a start in this direction by providing that any amendment to the State charter proposed by five per cent. of the State voters should be submitted to the people. It was also provided by constitutional amendment that henceforth

amendments to the constitution must receive an affirmative vote equal to a majority of the votes in the election of State officers.

National Representatives and State Officers.—The Representatives from Minnesota were (1898): James A. Tawney, from Winona; James T. McCleary, from Mankato; Joel P. Heatwole, from Northfield; Fred C. Stevens, from St. Paul; Loren Fletcher, from Minneapolis; Page Morris, from Duluth, and Frank M. Eddy, from Glenwood. All are Republicans. Senators: Knute Nelson (Rep.), from Alexandria, and a Republican. Officials: John Lind, Governor; L. A. Smith, Lieutenant-Governor; Albert Berg, Secretary; A. T. Koerner, Treasurer; R. C. Dunn, Auditor; W. B. Douglas, Attorney-General. All except Lind are Republicans. Chief Justice, Charles M. Start (Rep.), Associates, William Mitchell (Dem.), Daniel Buck (Dem.), Thomas Canty (Dem.), and L. W. Collins (Rep.); Clerk, Darius F. Reese (Rep.). The State legislature consists of 137 Republicans, 43 Democrats and 2 Independents.

MINNESOTA, UNIVERSITY OF, at Minneapolis, organized by the State in 1868, and governed by a board of regents, is non-sectarian and co-educational. For the year 1898-99 the faculties included 186 professors and instructors besides 28 lecturers and clinical assistants; in 1898 there were conferred 317 degrees, the library comprised 60,000 volumes and the herbarium 200,000 specimens. According to the catalogue issued August 1, 1898, the number of students in the several departments was as follows: Graduate departments, 184; college of science, literature and arts, 934; school of chemistry, 6; department of agriculture, 470; college of law, 439; college of medicine and surgery, 226; college of homeopathic medicine and surgery, 27; college of dentistry, 96; college of pharmacy, 60; total for department of medicine, 409; total, 2,588; there were besides 302 in the summer school for teachers, making the entire enrollment, excluding duplicates, 2,890. Of these 2,059 were men and 831 women. Total number of graduates, 2,849. The length of course in the law school is three years; medical schools, four years; department of agriculture, three years; dentistry, three years; pharmacy, two years. Graduates of the law school are not required to pass the bar examination of Minnesota. The productive funds amount to \$1,250,000, and the total annual income is \$300,000. President, Cyrus Northrop, LL. D.

MINTO, Fourth Earl of, GILBERT JOHN MURRAY KYNYNMOND ELLIOT, was appointed in July, 1898, Governor-General of Canada, to succeed the Earl of Aberdeen, who assumed the office in 1893. The family of Elliot has been prominent in public life, the first earl having been Governor-General of India, and other members of the family having held prominent positions. Lord Minto was born July 9, 1845; was educated at Trinity College, Cambridge, and in 1867 entered the Scots Guards, becoming a lieutenant in 1870 and retiring the same year. He, at that time Viscount Melgund, served with the Turkish army in 1877, and in the Afghan War in 1879. In 1881 he was private secretary to Gen. Lord Roberts at the Cape, and the next year volunteered his service in the Egyptian campaign. From 1883 to 1885 he was military secretary to the Marquis of Landsdowne, Governor-General of Canada, and in the latter year served as chief of staff to Gen. Middleton in the Riel rebellion. He has commanded since 1888 the South of Scotland Infantry Volunteer Brigade. In 1883 he married Mary, daughter of the late General Hon. Charles Grey, and sister of the present Earl Grey; and in 1891 he succeeded his father, the third earl.

MISSIONS, CHRISTIAN FOREIGN. The oldest foreign missionary society in the United States. The American Board, organized in 1810, now consists of a total missionary force of 3,508. It has 20 missions, 1,372 stations, 1,617 meeting places for congregations, 465 churches with 47,122 members, of whom 4,602 were added; 145 higher schools with 7,345 pupils; 1,139 common schools with 46,963 pupils, 543 missionaries, and 2,977 native preachers, teachers, etc. The fields lie in Mexico, Japan, North China, Shansi in Northwestern China, Foo Chow and Hong Kong in Southern China, Ceylon, Madura, Africa, Turkey, Austria, Spain, Hawaii and other islands of the Pacific. The head office is at the Congregational House, Beacon street, Boston, and the two district offices are at the United Charities Building, Twenty-second street and Fourth avenue, New York, with Rev. C. C. Creegan, District Secretary, and at 153 La Salle street, Chicago, with Rev. A. N. Hitchcock, District Secretary. The officers are: Charles M. Lamson, Hartford, President; Frank D. Wiggin, Treasurer, and Judson Smith, Charles H. Daniels, James L. Barton, Henry A. Stimson and Edward N. Packard, Secretaries. There is also a presidential committee of twelve members. A World's Ecumenical Missionary Conference will be held in New York in 1900, at which missionaries from all parts of the world will gather. The American Board of Foreign Missions is its chief supporter. The Christian Alliance and Missionary Alliance formed many auxiliary and local branches in 1898. Its buildings are at South Nyack, N. Y., and it supports the Missionary Training Institute for the training of Home Workers, Berachah Home, and Berachah Orphanage. Officers for 1899 are: President and General Superintendent, Rev. A. B. Simpson, New York; Secretary, A. E. Funk, and Treasurer, David Crear.

MISSISSIPPI, one of the Gulf States of the United States, with an area of 46,810 sq. m. Capital, Jackson.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 39,951,074 bushels, value, \$15,573,119; wheat, 30,094, \$24,978; oats, 2,406,295, \$1,010,644; potatoes, 418,174, \$301,085; hay, 107,540 tons, \$903,336; and cotton (season of 1897-98), 1,524,771 bales, \$44,160,570—total value, \$61,973,732. The State ranked second in production of cotton. Live-stock comprised: horses, 201,477; mules, 163,082; milch cows, 256,951; other cattle, 304,118; sheep, 239,720; and swine, 1,957,399—total head, 3,122,747.

Manufactures.—In 1897-98 there were 7 cotton mills in operation, which had a total of 71,770 spindles, an increase of about 16,000 since 1890, and used 20,508 bales in their work. The clay industry was represented by 53 plants, which were principally engaged in the manufacture of brick and tile.

Commerce.—The imports of merchandise at the port of Pearl river, in the fiscal year ending June 30, 1898, amounted in value to \$528; exports, \$1,371,538, a considerable falling off in each in a year.

Railroads.—On Jan. 1, 1898, the length of railroads in the State was 2,645 miles, of which 92 were constructed in the previous year. The most important of recent projects is the road to connect Mobile with Jackson, which will render accessible a vast tract of valuable pine timber land within this State.

Banks.—On Oct. 31, 1898, there were 10 national banks in operation and 5 in liquidation. The active capital aggregated \$855,000; circulation, \$230,306; deposits, \$2,243,510; reserve, \$546,911. The State banks, June 30, 1898, numbered 86, and had capital, \$3,700,595; deposits, \$9,280,036; resources, \$14,985,238.

Education.—The last available returns, for the school-year 1894-95, showed that of the total school population 212,700 were white and 309,800 colored; enrollment, 162,830 white and 187,785 colored; attendance, 99,048 white and 103,635 colored; and teachers, 4,591 white and 3,264 colored. For higher education there were 81 public high schools; 59 private secondary schools; 7 public and 9 private normal schools; 5 colleges and universities, co-educational and for men only; 2 technical institutions; 13 colleges and seminaries for women, and one law school. There was a State agricultural and mechanical college for whites at Agricultural College Station, and one for colored students at Westside. The Federal allotment to the State to promote agriculture and the mechanic arts was \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 211 periodicals, of which 11 were dailies, 170 weeklies and 17 monthlies.

Finances.—The assessed valuations in 1897 were: real estate, \$113,210,931; personal property, \$44,994,791; railroad, telegraph and telephone property, \$24,682,876—total, \$182,888,598; tax rate, \$6.50 per \$1,000. The bonded debt aggregated \$2,633,292, which included \$1,612,512 in school funds, the only debt on which interest has to be paid. A temporary loan of \$85,000 was negotiated in 1897 for two years.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 1,485,000. Local estimates gave Vicksburg 20,200; Meridian, 16,000; Jackson, 12,000.

Elections and Legislation.—The history of the elections in Mississippi for 1898 shows the State to be entirely Democratic. There was a special session of the legislature, lasting twenty-eight days, in January and February, 1898. A noteworthy act was passed providing that every employee of any corporation shall have the same rights and remedies for an injury suffered by him from an act or omission of the corporation or its employers as are allowed by other persons not employees where the injury results from the negligence of a superior agent or officer, or of a person having the right to control or direct the services of the party injured, and also when the injury results from the negligence of a fellow servant engaged in another department of labor from that of the party injured, or of a fellow servant on another train of cars, or one engaged to do a different piece of work. Knowledge by an employee injured of the defective or unsafe character or condition of any machinery, ways, or appliance, or of the improper loading of cars, shall not be a defense to an action for injury caused thereby, except as to conductors or engineers in charge of dangerous or unsafe cars or engines voluntarily operated by them. There was also legislation against trusts and combinations. Every corporation entering into or sharing the profits or loss of any trust or "combine" shall forfeit its charter and franchise, and forfeit its right to do business in the State, if it is a foreign corporation. The Attorney-General must enforce this by process of law, and all violators of this law are to be punished by fine and imprisonment.

National Representatives and State Officers.—The Representatives from Mississippi are: John M. Allen, from Tupelo; Thomas Spight, from Ripley; Thomas C. Catchings, from Vicksburg; A. F. Fox, from West Point; J. S. Williams, from Yazoo; Frank A. McLain, from Gloster, and Patrick Henry, from Brandon. All are Democrats. Senators: Hernando S. Money (Dem.), from Carrollton, and another Democrat. Officials: A. J. McLaurin, Governor; J. H. Jones, Lieutenant-Governor; J. L.

Power, Secretary; A. G. May, Treasurer; W. D. Holder, Superintendent of Education; H. L. Whitfield, Attorney-General, and William Henry, Adjutant-General. All are Democrats. Chief Justice, T. H. Woods; Associates, S. H. Terral and Albert H. Whitfield; Clerk, Edward W. Brown. All are Democrats. The State legislature is entirely Democratic, with the exception of two Populists in the House of Representatives.

MISSOURI, a central State of the Mississippi valley, has an area of 69,415 sq. m. Capital, Jefferson City.

Mineralogy.—John A. Gallagher, who was appointed State geologist in 1897, and who is compiling an exhaustive report on the geology of Missouri, has given a synopsis of present conditions, which, in connection with reports for the calendar year, 1897, shows important changes in the mineralogical history of the State. In the central southern part rocks exist that are not found in any other part of this country. They are the magnesian limestones and cotton rocks. The supply of lead and zinc in the southwest part is practically inexhaustible. There have been recent discoveries of these metals in Cole county, near Jefferson City, and in Pettis county, not far from Sedalia, that promise well, and as the structure of the ground and rocks in Pettis county is much the same as in Jasper county, Mr. Gallagher expects to find equally valuable lead and zinc deposits in Pettis. The supply of iron in the southeast part will not last so long as the lead and zinc. Coal is also inexhaustible. During 1897 iron mining yielded only 600 tons. The American production of nickel and cobalt was limited to the by-product obtained in lead smelting at Mine La Motte, this State, and amounted to 23,707 lbs., value, \$7,823, a notable increase in a year. The yield of copper has so declined that Missouri has not been individually included among the copper-producing States since 1884, when it had an output of 230,000 lbs. In lead, the report under consideration credits Missouri, Kansas, Wisconsin, Illinois, Iowa and Virginia with a total product of 56,542 short tons, without showing the proportions of the States grouped; but in zinc Missouri produced 18,125 short tons in 1897, and 10,371 tons in the first half of 1898. The output of coal from 105 mines was 2,665,626 short tons, value, \$2,887,884, an increase of 334,084 short tons in a year. This was wholly for local consumption, as the coal fields are too strongly surrounded by those of other States to permit general sales out of the State. The clay industry showed some weakness, the output of 280 plants having a value of \$2,396,528, principally in brick and tile; while quarrying grew stronger, with a production valued at \$1,173,642, chiefly in limestone and granite.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 154,731,486 bushels, value, \$41,777,501; wheat, 14,104,454, \$8,321,620; oats, 15,866,168, \$3,649,219; barley, 15,820, \$5,695; rye, 158,549, \$74,518; buckwheat, 40,290, \$24,174; potatoes, 6,320,358, \$2,780,958; hay, 3,578,110 tons, \$20,753,038; and cotton, 26,848 bales, \$777,663—total value, \$78,164,386. The State ranked fourth in production of corn. Live-stock comprised: horses, 762,734; mules, 183,362; milch cows, 673,195; other cattle, 1,460,647; sheep, 616,102; and swine, 2,949,818—total head, 6,645,860.

Industries.—Besides the industries already mentioned, there were taxable manufactures during the fiscal year ending June 30, 1898, that yielded the Federal government \$9,040,790 in internal revenue. The various tobacco factories had a combined output of 64,056,294 cigars, 424,424,100 cigarettes, 58,350,734 pounds of plug, 73,916 pounds of fine cut, 4,567,238 pounds of smoking, and 24,128 pounds of snuff. Out of 137 distilleries registered, 106 were operated during the year. The production of spirits was 1,188,648 gallons, principally neutral spirits, and of fermented liquors, 2,427,719 barrels. The output of oleomargarine was 944,731 pounds, nearly three times that of the previous year.

Commerce.—During the fiscal year ending June 30, 1898, the imports of merchandise at the delivery ports of Kansas City, St. Joseph and St. Louis, aggregated in value \$2,963,289, a decrease in a year of \$203,751; exports, nothing. The movement of gold and silver was: imports, \$189,746, a decrease of \$207,579; exports, nothing; making the total direct foreign trade of the year \$3,153,035.

Railroads.—On Jan. 1, 1898, the length of the various roads within the State was 6,695.41 miles, of which 118.49 miles were constructed during the previous year.

Banks.—On Oct. 31, 1898, there were 62 national banks in operation and 64 in liquidation. The active capital aggregated \$14,815,000; circulation, \$5,821,593; deposits, \$73,870,895; reserve, \$18,903,471. The State banks, July 14, 1898, numbered 494 and had capital, \$19,486,900; deposits, \$75,986,310; resources, \$109,763,609; private banks, 85, with capital, \$921,370; deposits, \$5,032,281; resources, \$7,155,658. The exchanges at the U. S. clearing houses at St. Louis, Kansas City and St. Joseph, in the year ending Sept. 30, 1898, aggregated \$2,102,391,681, an increase in a year of \$213,408,718.

Education.—At the end of the school-year 1896-97, there were 973,147 persons of school age, of whom 673,152 were enrolled in the public schools, and 490,431 were in daily attendance. The percentage of enrollment by races was: White, 73.08;

colored, 68.37. There were 14,413 school houses, 14,938 teachers, public school property valued at \$16,718,410, and expenditures, \$6,713,892, including \$4,305,904 for teachers' salaries. For higher education there were 189 public high schools; 88 private secondary schools; 5 public and 6 private normal schools; 25 colleges and universities, co-educational and for men only, with 419 professors and instructors, 5,445 students, and \$610,753 income; 13 colleges and seminaries for women with 170 instructors, 1,304 students, and \$178,620 income; and 6 theological, 2 law, and 15 medical schools. The federal appropriation to the State to promote agriculture and the mechanic arts was \$22,000 in 1897, and \$23,000 in 1898. In the last year there were 1,034 periodicals, of which 85 were dailies, 765 weeklies and 131 monthlies.

Finances.—The assessed valuations for 1897, about one-fourth actual value, aggregated \$1,053,792,873, the highest figure ever reached; tax rate, \$2.50 per \$1,000. The total bonded debt April 1, 1898, was \$4,200,000; school and seminary certificates, \$4,369,839—total, \$8,569,839. The certificates are not considered a part of the State debt proper, as they represent a permanent investment for the benefit of the schools, which have the interest on them. The State is now collecting nearly \$1,000,000 annually for the extinction of its debt proper and the payment of interest thereon. All actual debt bonds are subject to call at any time, and the State constitution provides that at least \$250,000 must be called in and retired annually.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 3,310,000. Local estimates gave St. Louis, 638,500; Kansas City, 200,000; St. Joseph, 70,000; Poplar Bluff, 12,000; Jefferson City and Moberly, each 10,000; Nevada, 9,000; St. Charles, 8,500; Warrensburg, 7,160, and Chillicothe, 6,660.

Political Affairs.—In the elections of 1898 the Democrats gained an easy victory. The Governor was elected by 25,000 majority, and the Democrats control the legislature. The Populist State party split on the question of fusion at the Populist State convention held in St. Louis on July 7, and two conventions were held. The regular committee on resolutions reaffirmed the principles adopted by the Omaha and St. Louis conventions, declaring money for carrying on the war with Spain should be obtained by the coinage of silver and the issue of legal tender notes, and not by an enormous increase in taxation and enlargement of the public debt. It also declared that the present system of using bank credit as a circulating medium was extravagant and dangerous.

National Representatives and State Officers.—Missouri's Representatives are: James T. Lloyd (Dem.), from Shelbyville; W. W. Rucker (Dem.), from Keytesville; John T. Daugherty (Dem.), from Liberty; Charles F. Cochran (Dem.), from St. Joseph; William S. Cowherd (Dem.), from Kansas City; David A. De Armond (Dem.), from Butler; James Cooney (Dem.), from Marshall; Richard P. Bland (Dem.), from Lebanon; Beauchamp Clark (Dem.), from Bowling Green; Richard Bartholdt (Rep.), from St. Louis; Charles F. Joy (Rep.), from St. Louis; Charles E. Pearce (Rep.), from St. Louis; Edward Robb (Dem.), from Perryville; William D. Vandiver (Dem.), from Cape Girardeau, and Maccaenus E. Benton (Dem.), from Neosho. Senators: George G. Vest (Dem.), from Kansas City, and another Democrat. Lon V. Stephens, Governor; August H. Bolte, Lieutenant-Governor; Alexander A. Lesueur, Secretary; Frank J. Pitts, Treasurer; James M. Serbert, Auditor; M. F. Bell, Adjutant-General; E. C. Crow, Attorney-General; W. T. Carrington, Superintendent of Education; E. T. Orear, Commissioner of Insurance, and John R. Rippey, Secretary State Board of Agriculture. All are Democrats. Chief Justice, James B. Gantt; Associates, Thomas A. Sherwood (Dem.), Garton D. Burgess (Dem.), Theo. Brace (Dem.), L. B. Valliant (Dem.), W. C. Marshall (Dem.), and Walter M. Robinson (Rep.); Clerk, J. R. Green (Dem.). The State legislature is composed of 105 Democrats, 67 Republicans, and 2 Populists.

MITCHELL, S. WEIR, physician and author, born in Philadelphia, Feb. 15, 1829. After graduation at the University of Pennsylvania he took his degree at the Jefferson Medical College in 1850. He served in the Civil War as a surgeon, has written books on his specialty—nervous troubles—and has given much attention to the study of poisons, particularly that of snakes. Dr. Mitchell has written seven volumes of poems, which were collected and published in 1896; has also written novels, the most successful of which were *Hugh Wynne* (1897) and *Adventures of François* (1898).

MOHAMMEDANISM. See RELIGIONS.

MONAZITE. Monazite, the phosphate of cerium and lanthanum, and containing small quantities of didymium and thorium is used for the manufacture of incandescent mantles for gaslights. In the United States the chief supply has been obtained from North Carolina, where it is found in placer deposits and mined by hydraulic methods. Deposits have been reported from time to time from other localities in the United States, but none of them have become of commercial importance. The American industry has a new and dangerous rival in that of Brazil, where vast deposits of monazite sand are said to occur, averaging 90 per cent. in purity. The production in North Carolina up to October was 65 tons.

MONEY. The monetary history of the year 1898 is very important. The chief events of the fiscal year ending June 30 were the reorganization of the Japanese monetary system with gold as the standard; the carrying out of the resumption of specie payments by Russia, and the persistence of the government of India in its refusal to unite with the governments of the United States and France in an effort to establish bimetallism by international agreement. Other important aspects of monetary affairs in 1898 were the currency troubles in India and the continued efforts to secure an improved currency system in the United States. For an account of these matters see the articles BANK—BANKING, BIMETALLISM, CURRENCY REFORM, INDIA (paragraph Currency), RUSSIA, JAPAN and the UNITED STATES. Under the title of each country, moreover, some details in regard to its monetary affairs are given. The following table, taken from the report of the Comptroller of the Currency for the fiscal year ending June 30, 1898, presents some facts of interest in regard to the monetary systems of the principal countries:

Monetary Systems and Approximate Stocks of Money in the Aggregate and Per Capita in the Principal Countries of the World in 1898.

COUNTRIES.	Monetary System.	Ratio between gold and full legal tender silver.	Ratio between gold and limited tender silver.	Population.	Stock of gold.	STOCK OF SILVER.			Uncovered paper.	PER CAPITA.			
						Full tender.	Limited tender.	Total.		Gold.	Silver.	Paper.	Total.
		1 to—	1 to—	Mu- lions.	Mu- lions.	Mu- lions.	Mu- lions.	Mu- lions.	Mu- lions.				
United States†...	*G and S	15.98	14.95	74.5	\$925.1	\$561.5	\$76.7	\$638.2	\$326.1	\$12.42	\$8.56	\$4.88	\$25.86
United Kingdom.	G	14.28		39.8	438.0		121.7	121.7	112.0	11.01	8.08	2.81	16.88
France	G and S	15½	14.38	38.5	810.6	378.5	46.3	419.8	124.6	21.06	10.90	3.23	35.19
Germany....	G		13.967	52.3	668.5	95.2	117.6	212.8	132.2	12.78	4.07	2.53	19.38
Belgium....	G and S	15½	14.38	6.5	30.0	40.0	5.0	45.0	79.1	4.62	6.92	12.17	23.71
Italy.....	.....do. .	15½	14.38	31.3	98.5	16.0	26.5	42.5	169.5	3.08	1.30	5.41	9.85
Switzerland .....	.....do....	15½	14.38	3	24.0		10.7	10.7	14.3	8.00	8.56	4.77	16.33
Greece .....	.....do....	15½	14.38	2.4	.5	.5	1.0	1.5	30.6	.21	.62	12.75	13.58
Spain .....	.....do....	15½	14.38	18	45.5		49.8	49.8	137.5	2.53	2.76	7.64	12.93
Portugal....	G		14.08	5.1	5.2		6.1	6.1	39.0	1.02	1.20	7.64	9.86
Roumania..	G and S			5.4	14.5		10.6	10.6	33.7	2.69	1.96	6.24	10.89
Servia .....	.....do....			2.8	1.2		2.7	2.7	2.7	.52	1.17	1.17	2.86
Austria													
Hungary..	G		13.69	45.4	251.8	48.5	97.0	145.5	86.2	5.55	3.20	1.90	10.65
Nether-lands.....	G and S	15½	15	4.9	21.9	52.7	3.4	56.1	45.5	4.47	11.45	9.28	25.20
Norway	G		14.88	2	7.8		2.3	2.3	3.8	3.90	1.15	1.90	6.95
Sweden.....	.....do....		14.88	5	8.6		5.7	5.7	27.7	1.72	1.14	5.54	8.40
Denmark....	.....do....		14.88	2.3	15.3		5.4	5.4	7.0	6.65	2.85	3.04	12.04
Russia .....	.....do....	15½	12.90	129.2	756.6	83.4	45.0	128.4		5.86	.99		6.85
Turkey.....	G and S	15½	15.875	24.1	50.0	30.0	10.0	40.0		2.07	1.66		3.73
Australasia	G		14.28	5	132.1		7.0	7.0	22.5	26.42	1.40	4.50	32.32
Egypt .....	.....do....		15.68	9.7	30.0		6.4	6.4		3.09	.66		3.75
Mexico	S	16½		13	8.6	1061.0		106.0	4.0	.67	8.15	8.07	11.89
Central American States .....	.....do....			3.3	1.3	19.0		19.0	8.4	.89	5.76	2.54	8.09
South American States.....	S	15½		37.5	77.5	25.0	10.0	35.0	750.6	2.07	.93	20.01	23.01
Japan.....	G and S	32.36		45.	79.9	41.9	16.5	60.4		1.77	1.34		3.11
India .....	.....do....	15		293.9		592.1		592.1	117.3		1.99	.40	2.39
China.....	S			388.3		750.0		750.0			1.96		1.96
Straits Set-lements..	.....do....			3.9		246.0	2.0	242.0			62.05		62.05
Canada.....	G		14.28	5.3	16.0		5.0	5.0	35.0	3.01	.95	6.60	10.56
Cuba.....	G and S	15½		1.8	2.0		1.5	1.5		1.11	.83		1.94
Haiti.....	.....do....	15½		1.	4.0	3.0	1.5	4.5	4.1	4.00	4.50	4.10	12.60
Bulgaria....	.....do....	15½	14.38	3.3	1.0	3.4	3.4	6.8		.30	2.06		2.36
Siam.....	S			5.	20.0	193.4		193.4		4.00	38.68		42.68
Hawaii.....	G and S	15.98	14.95	1.	4.0	1.0		1.0		40.00	10.00		50.00
Cape Col-ony	G		14.28	1.8	37.5		1.0	1.0		20.83	.55		21.38
South Afri-can Re-public .....	.....do....		14.28	.9	29.2		1.2	1.2		32.44	1.33		33.77
Finland .....	.....do....		15.50	2.6	4.3		.4	.4	9.4	1.65	.15	3.62	5.42
Total....				1,311.4	4,619.0	3,276.1	701.4	3,977.5	2,322.8	3.52	3.06	1.77	8.33

* G (gold), S (silver).

† Nov. 1, 1898; all other countries Jan. 1, 1898.

The aggregate population of these 37 countries was 1,311,400,000, and it will be seen from the above table that the total amount of gold held by them was \$4,619,000,000; of silver, \$3,977,500,000, and of uncovered paper, \$2,322,800,000. This when compared with all the returns for 1897 shows an increase in gold of \$259,400,000. The stock of gold has increased as compared with 1897 in the United States, Russia, Austria-Hungary, France, Germany and the South American Republics, the increase in the two first mentioned countries being especially large. In the United Kingdom, on the other hand, the amount of gold has decreased, and the same is true of Japan, Roumania and Belgium. As to silver, a comparison with 1897 apparently shows a falling off, but this is chiefly due to a change in the estimate of the amount of silver in India. The stock of uncovered paper has also been reduced, apparently by about \$243,000,000. This reduction is especially marked in the case of Russia, which country has, as we have seen, been returning to a specie basis. The Director of the Mint reports that while Russia had \$467,200,000 of uncovered paper in 1897, she had none in 1898. The reduction has also been considerable in Austria-Hungary, the United States and Portugal, while an increase in the amount of uncovered paper currency is shown by the South American Republics, India, Spain, Roumania, Sweden, Italy, Germany and the Netherlands. By a study of the above table it will be seen that the amount of uncovered paper per capita is greatest in the South American States where it is \$20.01, while Greece and Belgium come next, with \$12.75 and \$12.17 respectively.

MONSON, Sir EDMUND JOHN, G. C. B., G. C. M. G., M. A., English Ambassador to the French Republic, was born at Chart Lodge, Kent, Oct. 6, 1834, being a son of the sixth Baron Monson. He was educated at Eton and at Balliol College, Oxford, becoming a fellow of All Souls, Oxford, in 1858. In 1856 he entered the diplomatic service as attaché at Paris, and held the same position in 1858 successively at Florence, Paris, and Washington, becoming here private secretary to Lord Lyons, which position he retained until 1863, when he went as attaché to Hanover, but the same year was transferred to Brussels. He resigned in 1865 and contested Reigate unsuccessfully; in 1869 was appointed Consul in the Azores, and Consul-General for Hungary in 1871. He was made a C. B. in 1878; was appointed Minister to Uruguay, 1879, to Paraguay and Argentina, 1884, to Denmark, 1884, to Greece, 1888, and to Belgium, 1892. This same year he was made a G. C. M. G. In 1893 he became Ambassador to Austria and was also made a privy councillor. In August 1896 he succeeded Lord Dufferin as Ambassador at Paris. On Dec. 6, 1898, at a banquet given at the Chamber of Commerce in Paris, Monson created no small sensation by a speech in which he characterized the recent attitude of France toward England as a "policy of pin pricks." See GREAT BRITAIN.

MONTANA, a northwestern State of the United States, with an area of 146,080 sq. m. Capital, Helena.

Geology and Mineralogy.—Operations and results during the calendar year 1897 show that the State is undergoing a marvelous development of her mineral resources. The metallic output of the year aggregated in value \$53,954,675, the highest figure ever reached in the history of the State. Of many new features, the advancement of the State to first rank as a copper-producer is the most surprising. Not only did Montana lead all the States, but she surpassed the entire Lake Superior region, had an output equal to 46.6 per cent. of the whole product of the country, and doubled her aggregate of 1891. The output was 230,288,141 pounds, valued at \$26,708,915. In lead the State held fourth rank, with 12,930 short tons, value \$928,619. Coal mining, which has steadily increased since 1887, yielded 1,647,882 short tons from 22 mines, value \$2,897,408. Increased activity in gold and silver mining gave the State second place in silver, with an output of 15,667,900 fine ounces, valued, according to the United States assayer at Helena, at \$21,730,710, and according to the director of the mint, at \$20,257,487; and fourth place in gold, with an output of 211,563 fine ounces, valued, according to the two authorities, at \$4,496,430 and \$4,373,400. In the period 1862-1898 the total metallic output of the territory and State has been equal in value to \$750,000,000. Almost the entire product of copper is from the Butte district, which produced in copper, gold, silver, and lead in 1883-98 a total value of \$383,086,779. In January 1899, it was reported that the output of copper during 1898 was approximately 300,000,000 pounds; that 6,548 men were employed at the mines and about 2,000 at the smelters and concentrators; and that \$9,762,480 was paid out in wages and \$10,000,000 in dividends.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 44,744 bushels, value \$29,531; wheat, 2,100,040, \$1,218,027; oats, 2,478,508, \$867,478; barley, 188,640, \$107,525; potatoes, 473,304, \$260,317; and hay, 504,604 tons, \$3,431,307—total value, \$5,914,185. Live-stock comprised, horses, 164,923; mules, 924; milch cows, 43,994; other cattle, 952,598; sheep, 3,377,547; and swine, 42,265—total head, 4,582,251. The State led all the others in the number of sheep.

Railroads.—On Jan. 1, 1898, the length of all railroads was 2,906.90 miles, of which 15.40 miles were constructed during the previous year. The assessed valuation of railroad property for 1897 was \$13,674,052; amount of taxes levied, \$334,110.

Banks.—On Oct. 31, 1898, there were 21 national banks in operation and 23 in liquidation. The active capital aggregated \$2,555,000; circulation, \$752,923; deposits, \$10,799,345; reserve, \$4,502,225. There also were 7 State banks, June 30, 1898, with capital, \$485,000; deposits, \$1,607,339; resources, \$2,637,124.

Education.—At the close of the school-year 1896-7, there were 46,179 persons of school age in the State, of whom 31,436 were enrolled in the public schools and about 21,200 were in daily attendance. There were 628 public school buildings; 1,020 teachers; public school property valued at \$1,663,245; and expenditures, \$792,098, of which \$438,133 was for teachers' salaries. For higher education the State had 14 public high schools; 4 private secondary schools; 3 colleges and universities, with 26 professors and instructors, 341 students, and \$36,050 income; and the Montana Agricultural College at Bozeman, the name of which was changed in 1897 to Montana State College. This institution received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In 1897 bonds for \$100,000 were authorized for completing and furnishing the State University at Missoula, a State Normal School was opened at Dillon, and the legislature provided for submitting the question of free text-books to popular vote in each school district. There were 93 periodicals in 1898, of which 11 were dailies, 72 weeklies, and 7 monthlies.

Government.—The legislature in 1897 created the new county of Broadwater, making 24 in the State, and enlarging the legislature to 24 Senators and 70 Representatives. The present county seat is Townsend. New laws include acts prohibiting gambling, imposing an inheritance tax, requiring licenses for insurance companies, amending the fish and game law, and reorganizing the State militia.

Finances.—The assessed valuations for 1897 were: real estate, \$67,175,587; personal property, \$49,907,770; railroad property, \$13,674,052—total, \$130,757,411; tax rate, \$2.50 per \$1,000. There is no bonded State debt, but there are loans on land grants, for which the State is not liable, amounting to \$600,000, issued for the capital and educational buildings.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 230,000. Local estimates gave Butte, 50,000; Anaconda, 15,000; Great Falls, 11,250; and Missoula, 5,200.

Elections.—Montana's controlling vote is Democratic. The vote for State officers in 1898 was as follows: Democratic, 23,351; Republican, 14,823; Populist, 11,607.

National Representatives and State Officers.—Montana's Representative is A. J. Campbell (Dem.), from Butte. Senators: Thomas H. Carter (Rep.), from Helena, and a Fusionist. Officials: Robert B. Smith, Governor; A. E. Spriggs, Lieutenant-Governor; T. S. Hogan, Secretary; T. E. Collins, Treasurer; T. W. Poin-dexter, Auditor; C. B. Nolan, Attorney-General; C. F. English, Adjutant-General; E. A. Carleton, Superintendent of Education; J. H. Calderhead, Commissioner of Agriculture. All except English were elected by Democratic-Populist fusion ticket. Chief-Justice, Theodore Brantley (Rep.); Associates, W. H. Hunt (Rep.), and H. R. Buck (Dem.), and Clerk, Benjamin Webster (Rep.). The State Legislature has 18 Republicans, 75 Democrats, and 1 Populist.

MONTENEGRO. An independent principality situated between Bosnia and Albania, with an area estimated at 3,630 sq. m. and a population estimated at 228,000. Its capital is Cettigne or Cetinje, with a population variously estimated at from 1,500 to 2,920. The majority of the inhabitants belong to the Greek Orthodox Church, the Mohammedans and Roman Catholic together numbering about 26,000. Agriculture is the main occupation, but is carried on by very primitive methods. A species of common ownership prevails, but peasantry holdings occur in some districts. The chief crops are maize, oats, tobacco, potatoes, barley and buckwheat and in some parts of the country the vine and olive are cultivated with success. In the forests beech and oak trees abound. The public debt in 1898 amounted to about \$900,000, and the revenue in the preceding year was about \$300,000. The executive authority is vested in the reigning Prince, Nicholas I, and the Constitution, though nominally that of a limited monarchy rests on the patriarchal basis. There is a legislative council, consisting of 8 members, one-half of whom are nominated by the Prince and one-half chosen by the people.

Events of 1898.—Serious trouble occurred on the Montenegrin border in the year 1898. A tribe of Mohammedan Albanians attacked the Christians in the Berane district, and one report said that many of the villages in that region were reduced to ashes. The fighting seems to have been caused by long standing feuds between the two races. The Mohammedans chased the Christians into Montenegrin territory. It was officially declared by the Turkish government that the Mohammedan population had been driven to this revenge by the exactions, murders, and pillages committed by the Christians at Berane, and in June the Porte announced that the Impe-

rial troops had restored order. It was further announced that the Sultan had decided to extend his clemency toward the rioters and had ordered the rebuilding of the houses which had been burned and the restoration of the Christians to their homes. In this same communication from the Turkish government it was stated that a Turkish general had been ordered to make an investigation into the affair and a Montenegrin delegate appointed to join him in order to ascertain whether Turkish or Montenegrin officials were in any way to blame for the revolt. Attention was also drawn to Montenegro in the year 1898 by the agitation in that country for the creation of a new State consisting of Servia, Bosnia, and Herzegovina, to be ruled by Prince Nicholas of Montenegro.

MOON PHOTOGRAPHY. See ASTRONOMY.

MOON'S ATMOSPHERE. See PHYSICS (paragraph Planetary Atmospheres).

MOORE, GEORGE, born in Ireland about 1853. His books include: *Flowers of Passion* (1877); *Pagan Poems* (1881); *A Mummer's Wife* (1884); *A Drama in Muslin* (1886); *Confessions of a Young Man* (1888); *Miss Fletcher* (1889); *Impressions and Opinions* (1890); *Modern Painting* (1893); *Esther Waters* (1894); *Celibates* (1895); and *Evelyn Innes* (1898). The last named was the subject of much comment during the year.

MOORE, JOHN BASSETT, First Assistant Secretary of State, was nominated April 26, 1898, by President McKinley to that position which was made vacant by Assistant Secretary William R. Day's promotion to the Secretaryship. So great was the need in the State department of competent advisers on questions of international law at the outbreak of the Spanish-American War that Judge Day is said to have accepted the secretaryship only on condition that Prof. Moore be appointed his assistant; for Prof. Moore is recognized as high authority in the theory and practice of international law. He was born about 1848, was graduated from the University of Virginia in 1880, studied law with Judge Gray, who is United States Senator from Delaware, and, having been admitted to the bar, entered the State department in 1883 as a clerk. So thoroughly did he master the principles of international law and diplomacy that President Harrison appointed him third Assistant Secretary of State (1889). Although on April 6, 1891, Mr. Moore accepted a call to the chair of international law and diplomacy in Columbia University, at the intervention of Secretary of State Blaine, he did not begin his work there until the following year. Mr. Blaine was still opposed to his leaving the department and offered him as an inducement to stay the First Assistant Secretaryship, but Mr. Moore preferred the professorial chair, which he has since retained. On several occasions since 1892 he has been called upon by the government to render assistance in questions of international law, and in April 1898, he received from the University a leave of absence for one year. In politics he is a gold Democrat.

MORAVIAN CHURCH, has prospered during the past year. There are now 120 churches, 125 ministers, and 14,553 members. The mother-church is at Herrnhut, Saxony, where the general synod convenes every ten years. At a preparatory synod held at Lititz, Pa., in September, a new provisional board was elected and two bishops, Revs. E. A. Carter and Charles L. Moench, were chosen and consecrated. A proposition to change the name of the church was defeated. Missionaries were sent to Alaska, Nicaragua, and to the Indians in Southern California.

MORFIT, Dr. CAMPBELL, well known chemist, was born at Herculaneum, Missouri, November 19, 1820, and died in London, England, December 8, 1897. He was educated (but did not receive a degree) at Columbian University, Washington, D. C. He founded the chemical department of the Maryland Institute; from 1854 to 1858 he was professor of applied chemistry in the University of Maryland. From the latter year until 1861 he practiced his profession in New York and then went to London, where he gave much attention to the improvement of technical processes, his work in America having been largely in the investigation of sugars, salts, coals, guanos, gums, etc. In collaboration with Dr. James C. Booth he edited the *Encyclopedia of Chemistry*.

MORMONS, or LATTER DAY SAINTS, The Church of Jesus Christ of Latter Day Saints, founded by Joseph Smith, upon whose death in 1844 a body of some 10,000 went under the leadership of Brigham Young to Utah and established themselves in Salt Lake City. They report for 1898, 796 churches, 1,700 ministers, and 300,000 members, showing a gain of nearly 41,000 since 1897. During 1898 Lorenzo Snow was chosen president of the church on the death of Wilford Woodruff (q. v.), with George Q. Cannon and Joseph F. Smith for his counsellors. At the semi-annual conference, held at Salt Lake City, October 6, Elder Rudger Clawson was chosen to fill the vacancy caused by the death of President Woodruff, in the council of the

Apostles, which consists also of Franklin D. Richards, president; Brigham Young, Francis M. Lyman, John Henry Smith, George Teasdale, Heber T. Grant, John W. Taylor, Merriner W. Merrill, Anthon H. Lund, Matthias F. Crowley, and Abraham O. Woodruff. Of the population of Utah about seventy-five per cent. are Mormon. The Reorganized Church, or Reformed Latter Day Saints, claims to be a continuation of the original church founded by Joseph Smith in 1830, and stands in opposition to Brigham Young's church in Utah. It was organized in 1851 by officials and members of the original organization, and is now presided over by Joseph Smith, son of the original founder. Its general missionary work in all countries prospered during 1898 and since 1863 it has kept missionaries in Utah. They do not practice polygamy. Their home is in Leoni, Iowa. They report for 1898, 2,200 ministers, 610 churches, and 40,639 members, a gain of over 2,000 (making the total number of Latter Day Saints 340,639). See UTAH and WOODRUFF, WILFORD.

MORPHOLOGICAL SOCIETY, AMERICAN. See ZOÖLOGICAL SOCIETIES (paragraph American Society of Naturalists).

MORPHOLOGY OF PLANTS. See BOTANY (paragraph Histology and Morphology).

MOROCCO, a Sultanate in the Northwest corner of Africa between Algeria on the East and the Mediterranean Sea and Atlantic Ocean on the North and West and the Desert of Sahara on the South, having an area estimated at 219,000 sq. m. and a population variously estimated at from 2,500,000 to 12,000,000. The soil is fertile and among the grain crops raised are wheat, barley, maize, durra, etc., and among the fruits are figs, dates, pomegranates, oranges, and lemons. Besides these there are produced a great variety of vegetables and seeds and the country is said to be rich in mineral resources. The trade is chiefly with Great Britain, France, Spain, Germany, and Belgium, Great Britain taking the lead both in respect to imports and exports. The chief ports are Tangier and Mogador on the Atlantic and Tetuan on the Mediterranean. The government is an absolute despotism, the Sultan Abdul Aziz being the head of the Church as well as of the State. His authority, however, does not extend over some of the tribes in the interior. Morocco supports a standing army consisting of about 10,000 infantry and 400 cavalry, which make up the disciplined force, but there are also some 2,000 irregular cavalry. The trade in 1896 consisted of £1,286,847 exports and £1,315,536 imports.

MORRILL, JUSTIN SMITH, United States Senator, died December 28, 1898. He was born on April 14, 1810, and was educated in the common schools and academies. Upon reaching manhood he went into business as a merchant, but in 1854 was elected to Congress where he remained till 1867, when he was promoted to a seat in the Senate. He was successively elected to the latter office, and was holding it at the time of his death, the date for the expiration of his term being 1903. Thus he had a record of 44 years in Congress and 31 in the Senate, thus fairly earning the title of "father of the Senate." He came into national prominence in 1861 as the author of the Morrill tariff, which was prepared chiefly by his own energy. In the Senate he was regarded as an authority on the questions of finance, tariff, and taxation. He became Chairman of the Committee on Finance, a position which he was holding at the time of his death. He was a thorough-going Republican, an advocate of protection and a zealous supporter of a sound and stable currency. He was active in debate and his speeches showed thoughtful preparation and earnestness of purpose. One of his noteworthy speeches was delivered early in the year 1878 when the Bland silver bill came up in the Senate. On this occasion he offered some very keen criticisms of the measure, condemning a policy which required the United States to ostracize gold in favor of silver in its coinage. Down to the close of his life he took an active part in politics and his speeches in the Senate in recent years betrayed no waning of his powers. He was the author of *Self-Consciousness of Noted Persons* (1886).

MORSE, ELIJAH A., ex-member of Congress from Massachusetts, died at Canton, Mass., June 5, 1898. He was born at South Bend, Indiana, May 25, 1841. During the Civil War he served in the Fourth Massachusetts regiment; afterwards he built up a large business in the manufacture of stove polish. In 1876 he was elected to the Massachusetts State Assembly, and to the Senate in 1886 and 1887. He was a Republican member in the Fifty-first, Fifty-second, Fifty-third, and Fifty-fourth Congresses, and refused to accept the nomination for a seat in the Fifty-fifth Congress. Mr. Morse became well known as an advocate of legal restriction of the liquor traffic; he assisted in effecting protective laws for children and in prescribing penalties for crimes of immorality.

MOSAICS. See ARCHÆOLOGY (paragraph France).

MOSCOWSKI, MORITZ, pianist and composer, born in Breslau, Aug. 23, 1854. He was educated in Berlin and Dresden. His works include pianoforte solos (a con-

certo in five movements was first performed in 1898); concert pieces for violin and piano, Spanish dances, orchestral suites, symphonies, songs, duets, etc.

MOTOR CARRIAGES. See AUTOMOBILES.

MOTTL, FELIX, conductor, born in Vienna, Aug. 24, 1856. He was educated in the Vienna conservatory and was with Wagner in Bayreuth and Liszt in Weimar for many years. Since 1881 he has been conductor of the opera in Carlsruhe and Bayreuth. He has published various compositions and songs and two operas. In 1898 he conducted the *Ring* in London and a Mozart cycle in Carlsruhe. See MUSIC.

MOULTON, Rev. WILLIAM FIDDIAN, M. A., D. D., head master of the Leys School, Cambridge, died February 5, 1898. He was born at Leek, England, March 14, 1835; having been educated at the Woodhouse Grove School and at Wesley College, Sheffield, he entered the Wesleyan ministry in 1858 and from that year until 1874 was a classical tutor at Richmond College. In 1890 he was president of the Wesleyan Conference. He was an examiner in the Universities of Wales and London, and a member of the Cambridge Apocrypha Revision Committee and the New Testament Revision Committee. Dr. Moulton edited *Winer's Grammar of New Testament Greek*; among his publications are *History of the English Bible*, and *Commentary on Hebrews* (in Bishop Ellicott's *Popular Commentary*); together with Dr. Milligan he wrote a *Commentary on St. John's Gospel*.

MOUNT VERNON LADIES' ASSOCIATION, founded in 1854 by Miss Ann Pamela Cunningham, of South Carolina, who was the first regent. Its object is to care for and direct the General Washington estate at Mount Vernon, Virginia. The second regent was Mrs. Macalester Langhton, who died in 1891, and was succeeded by Mrs. Justine Van Rensselaer Townsend, of New York. Vice-regents are supplied by thirty-two States and there is an advisory committee of men. Harrison H. Dodge is the resident superintendent at Mount Vernon.

MUCILAGE. Dr. H. Kraemer has contributed a paper on the origin and detection of mucilage in plants. He observes that by the term "mucilage in plants" is meant those substances which are soluble, or at least swell very perceptibly in water and which, upon the addition of alcohol, are precipitated in a more or less amorphous or granular mass. Mucilage originates in the plant either as a part of the contents of the cell or as a part of the wall thereof. When it occurs as a part of the cell contents (as cell sap), mucilage is produced either as a secretion from the protoplasm, or it may possibly arise in some cases as a disorganization product of some of the contents. When it occurs as a membrane mucilage it owes its origin to several causes, being either a form of secondary thickening of the cell wall or a metamorphosis of the cell wall, at least in part. Mucilage may also arise from glandular hairs. The localization of mucilage in plants is readily made apparent by the use of methylene blue as a reagent.

MUCIN PRODUCED BY BACTERIA. Charles Lepierre has shown that certain fluorescent bacteria produce considerable quantities of mucin when grown in peptone culture media without meat. In the presence of lactates, malonates, malates and glycerates the mucin is produced without any fluorescence; whereas in citrates, succinates, pyrotartarates and a few other combinations, fluorescence occurs in addition to the formation of mucin. The mucin is also formed in the presence of asparigin. The formation of mucinoid substances has also been observed in the culture fluids of the "sleeping sickness" bacillus.

MULLER, GEORGE, philanthropist and founder of the great orphanage at Bristol, England, was born at Kroppenstadt, near Halberstadt, Prussia, September 27, 1805, and died at Bristol, March 10, 1898. A full account of his life and wonderful success may be found in his autobiography, or *Narrative*. He was a dissolute youth, but received a classical education, became convinced of the power of God, and began his evangelistic labors in England in 1829. Throughout his life he observed the rule never to make direct appeals for charity, but trusted in faith and prayer. His sincerity has been no more doubted than has the existence of the results of his labors. It is variously stated that from \$5,000,000 to \$7,000,000 were received and expended by him on the orphanages at Bristol. The work he accomplished along other lines was also marvellous. A report upon sixty-three years of his work states that besides his orphanage work, 121,683 young people were taught and 281,652 Bibles, 1,448,662 New Testaments, 21,343 copies of the Psalms, and 222,196 other portions of the Scriptures were circulated in many different countries and languages. "The distribution of religious literature has been in the aggregate enormous, more than 111,000,000 books, pamphlets and tracts having been sent out." His missionary journeys, which began in his seventieth year are given as follows:

1. March to June 1875—England. 2. August 1875, to July 1876—England, Scotland, and Ireland. 3. September 1876, to September 1877—Europe. 4. 1878—Canada and the United States; 19,247 miles, 308 addresses. 5. 1879—Europe. 6. August

1879, to June 1880—United States and Canada. 7. September 1880, to May 1881—United States and Canada. 8. 1882—Egypt, Asia Minor, Turkey, and Greece. 9. 1882—Germany, Austria, Russia, and Poland. 10. 1883—India. 11. 1884—England and Wales. 12. 1885—Isle of Wight. 13. November 1885, to June 1886—Australia, China, and Japan; 37,280 miles. 14. October 1886, to April 1889—Australia, New Zealand, and India.

Mr. Müller preached the Gospel in seven languages and forty-two countries and sometimes spoke as many as thirty-eight times in thirty-eight days, or forty-eight times in thirty-eight days. He travelled with his wife 200,000 miles by sea and land. Whatever may be said of the objective efficiency of prayer, Müller believed he had proved it. But the fact that he did not advertise and that this was widely known seems to go a long way toward accounting for his receiving the many gifts which in the aggregate were enormous.

MUNICIPAL BATHS. Within the past few years the establishment of public baths has received a great impetus. During the summer of 1898, the city of Boston maintained 23 bathing establishments; 13 floating, 6 on the ocean beach, 2 on rivers, and 2 artificial swimming pools. A total of 1,900,000 baths were taken in these establishments during the year, against 650,000 in 1897. The expense for administration in 1898 was under \$38,000, or less than 2 cents a bath. Expert instruction in swimming was given in 1898, over 3,500 children learning to swim. Children were allowed to bathe free of charge and at one bath there was no charge for adults. At the other places suits and towels were furnished to such adults as did not bring them at 5 cents for suits and 1 cent for towels. The Metropolitan Park Commission maintained at Revere Beach, in addition to the above, a large, fine ocean bathing establishment, at which 140,400 baths were taken during the season of 1898, the maximum for one day being 5,508 on a Sunday. In the Manhattan and Bronx boroughs of New York City there are 15 free public baths on the river fronts, where bathers must furnish their suits and towels. From June 1 to October 15, 1898, nearly 6,000,000 baths were taken, about one-third by women and girls. Other American cities have recently established municipal baths, some of which are open all the year and include swimming tanks, showers and tub baths. Brookline and Worcester, Mass., Providence, R. I., Pittsburg, Pa., and Chicago are among the places that have recently provided all-the-year baths. Many institutions, especially Young Men's Christian Associations, maintain baths and swimming pools for the use of their members. See PARKS.

MUNICIPAL GYMNASIA. A public gymnasium was given to the city of Boston in 1896 or 1897 and is operated by the city. A second one has been completed at a cost of some \$20,000 met by the city. This is probably the first indoor gymnasium built with municipal funds in the United States. Instruction to classes are given in these establishments.

MUNICIPAL LEAGUE, NATIONAL. See NATIONAL MUNICIPAL LEAGUE.

MUNROE, NEIL, author, born in Inverary, June 3, 1864. He began his career as a journalist on the *Glasgow Evening News*. His books include *The Lost Pibroch—Celtic Tales and Sketches* (1896); *John Splendid, a Highland Romance* (1898).

MUSEUM OF NATURAL HISTORY, AMERICAN, in Central Park incorporated in 1896, occupies a large building which has been in process of construction since 1874. Additions in 1897 and 1898 were the east wing, the west wing, and the large lecture room at the north end of the building. This museum has departments of public instruction, giving many free lectures on geology, mineralogy, conchology, zoology, vertebrate palæontology, anthropology and entomology, and possesses exceedingly rich collections. Admission is free five days in the week. The library contains 36,000 volumes. The museum sent out several field expeditions notably the Jesup anthropological expeditions, which in 1898 went to British Columbia and to the Pacific coast of Siberia. The disbursements for 1897 were \$108,548, and the receipts \$111,954, of which \$95,000 came from the city government. President, Morris K. Jesup. See also article ANTHROPOLOGY.

MUSICAL ART SOCIETY, organized in 1893 to perform and promote a love for ancient works of merit seldom given in concerts, has 325 members. President, Francis E. Hyde; Secretary, Miss Laura I. Post; Musical Conductor, Frank Damrosch.

MUSIC (in 1898). The year in Europe was brilliant and interesting. There were fewer orchestral tours than usual and no opera achieved a sudden popularity.

The composer of the greatest distinction was the Abate Don Lorenzo Perosi, musical director of St. Mark's, Venice, where he had performed for the first time his three oratorios: *The Transfiguration of Christ*, *The Resurrection of Lazarus*, and *The Resurrection of Christ*.

The work of several Russian composers, particularly Rimsky-Korsakoff, was introduced into Europe and America, and other new composers talked of are the metaphysical Richard Strauss, Vincent d'Indy, and Reynaldo Hahn.

Weingartner's trilogy on *Orestes* and Bungert's on the *Odyssey*, both of which are in preparation, are being much discussed in Germany. Verdi, too, outshone all the composers of operas by his four religious pieces: *Stabat Mater*, *Te Deum*, *Ave Maria*, and *Magnificat* for double mixed and female chorus, part with and part without accompaniments. These were first given in the Paris Opéra under the auspices of the Conservatoire, and were sung in Cologne, at the Leeds Festival, in London, Amsterdam, and in many German cities.

Of performers Paderewski, Ysaye, and Sarasate still continued in the height of favor, Sophie Menter and Teresa Carreño had long and successful tours, and the young Hungarian pianist, Dohnányi (born in 1877), rose into such esteem that he is now considered the "coming pianist." Of all the singers Mme. Marcella Sembrich had the greatest success, especially in Vienna, where she appeared as the star of an Italian Opera Company and took the city by storm, winning enthusiastic praise from the famous critic, Edouard Hanslick.

Personals.—Marie Delna achieved triumph in Paris as "Fidès" in *Le Prophète*; Mlle. Aino Ackté made a great impression at her début at the Paris Opéra. She is a native of Finland, and a pupil of Duvernoy. Sigurd Arnoldson was also very successful in Prague, Budapest, and St. Petersburg; Lola Beeth became popular in Roumania; the pianist Falcke in Germany; Vincent d'Indy gave concerts in Spain; Adolph Wilhelmj, son of the great violinist August Wilhelmj, demonstrated great talent as a violinist in England and Ireland.

Signor Piatti, the most famous living 'cellist, retired from his long career to Bergamo; Mustafa, director of the Sistine Chapel, celebrated his 50th jubilee and was succeeded by Perosi; Therese Malten, the famous singer, celebrated her 25th anniversary at Dresden; Peter Benoit was made director of the Royal Flemish Conservatory, at Antwerp; Emile Mathieu of Ghent; the Milan Conservatory became the Verdi Conservatory with Gallignani as director; Richard Burmeister became director of the Scharwenka Conservatory, New York; and Harold Randolph succeeded Asger Hamerik at the Peabody in Baltimore. César Thomson became Ysaye's successor as first violin professor in Brussels, and Ovide Musin was given this post in Liège.

Among the conductors the following changes took place: Felix Weingartner from Berlin to the Kaim orchestra, Munich; Richard Strauss from Munich to the Royal Opera, Berlin; Stavenhagen, who was succeeded by Keyajganowski of Hungary, to Munich; Otto Lohse to Strasburg; Joseph Wolf to Hamburg; Reichenberger to Stuttgart; Julius Rathart to Berlin; F. Löwe to the Court Opera, Vienna; Gericke to the Boston Symphony; Emil Paur to the New York Philharmonic; Walter Damrosch retired from the Symphony Society, which disbanded; and the Abate Perosi from St. Mark's to the Sistine Chapel. Reinhold L. Hermann succeeded Zerrenn as conductor of the Boston Handel and Haydn; Paul Klengel, Zoller of the New York Liederkrantz; and Frank Damrosch succeeded his brother, of the New York Oratorio Society. Hans Richter resigned his post as conductor of the Vienna Philharmonic and the freedom of Vienna was conferred upon him. He then became conductor of the Manchester Philharmonic. Dr. Hubert Parry was knighted by Queen Victoria; the Emperor of Austria gave the Order of the Iron Crown to Felix Mottl; and to Dvorák a decoration of arts and sciences given to one composer only—Brahms; Verdi received the *Annunziata*, the first order in Italy; and Hollman, the 'cellist, was made a chevalier of the *Légion d'honneur*.

Prizes.—The prizes that Paderewski offered for Polish competitors were awarded to Sigismond de Stojowski, a pupil of Delibes, for a symphonic composition (1,000 roubles); Emile Mlynarski, of Varsovie, concerto for violin (250 roubles); H. Melcer of Lemberg, for a piano concerto (250 roubles); Gawronski of Wilna, for a string-quartet (250 roubles); and George Fitelberg of Varsovie, for a sonata for violin and piano (250 roubles).

Prizes of 500, 150, and 100 marks for flute compositions, offered by a Prussian journal, were won by Otto Manns of London, Robert Baumbach of Mexico, and F. C. Schmeidler of Berlin. B. Morasco took a prize from the Conservatory of Palermo for the best oratorio; Edith Nutter, the Parepa Rosa prize from the Royal Academy of Music; and a rather strange prize of 1,000 bottles of wine was offered at Trarbach for the best song in praise of Mosel wine. Schuch, of Dresden, was presented with a gold medal from that city. Wilhelm Berger of Berlin, won a prize of 2,000 marks for a cantata of Goethe's *Meine Göttin*, from the Sängerverein of Königsberg. The Beethoven Verein offered two prizes in 1898 of 2,000 and 1,000 marks for the best two chamber compositions for wind instruments; and the city of Paris offered a prize of 10,000 francs for the best musical work for soli, chorus, and orchestra, in dramatic or symphonic form, to be submitted in September, 1899. The Musical Art of New York offered a prize of \$250 for a composition of mixed voices unaccompanied.

A score of Lortzing's *Czar und Zimmermann* was discovered among the opera archives in Agram (Croatia), bearing the composer's signature and date Oct. 18, 1839.

Manuscripts, etc.—The rare musical books exhibited at Turin in September (see PAINTING), ranging from manuscripts of the 11th and 12th century to music of the time of Glück, constituted the most complete and valuable collection of music-books ever gathered together. They were loaned from the Biblioteca Santa Cecilia, Rome; the Biblioteca Casanatensi, Rome; the Biblioteca Governativa, Luca; the Universities of Bologna, Turin, Genoa, etc. Paganini's violin was also exhibited. Portraits of Rossini and the originals of his chief rôles were given to the Rossini Music School at Pesaro.

An autographic choral work by Beethoven and nine new songs and fantasie and rondo by Schubert were discovered in an old drawer in St. Peter's Church, Vienna. The Society of the Friends of Music procured the former and a Viennese library is negotiating for the Schubert manuscripts. The manuscript of an unknown concert aria by Mozart was sold in Berlin to a Viennese purchaser for 9,800 marks. The library of the Paris Conservatoire secured the score of Rossini's *Guillaume Tell*; the Royal Library of Berlin secured original manuscripts of Beethoven and Haydn from the music publishers, Arturia, of Vienna; and a sketch-book of Mozart's, bearing an inscription by his father, Leopold, dated "London, 1764," and filled with sketches made in his eighth year was discovered in Berlin.

A new edition of the national song of Holland, *Wilhelmus van Nassouwe*, was published for the enthronement of Queen Wilhelmina, among whose gifts was a collection of sixteen marches played by the Dutch troops during the War of the Spanish Succession, 1702-1713. They were arranged for the piano by Averkang, and published by Breitkopf and Härtel. A. Wotquenne annotated the catalogue of the library of the Royal Conservatory at Brussels, which has over 12,000 volumes, 800 orchestral scores, 1,200 piano scores, and 6,000 books of Italian masters.

Opera Houses, etc.—The centenaries of Reissiger of Dresden and Gläser of Copenhagen, were celebrated in those cities; the Royal Orchestra of Dresden reached its 350th year; the Royal Theatre of Copenhagen its 150th; the Court Theatre of Munich its 120th; and the Musical Union of Innsprück its 80th year. Paris celebrated the 500th performance of Gounod's *Roméo et Juliette*; Berlin the 400th of *Tannhäuser*; and Budapest the 300th of Erkel's *Hunyadi László*.

Great interest was manifested in the representation of *Circe*, a portion of Bungert's trilogy, given in Dresden. Godesberg on the Rhine was chosen as the spot where the trilogy will be represented in 1900. Ground was given and 2,500 marks for an opera house to be completed in Cologne in 1902.

The new opera house in Stockholm was inaugurated Sept. 29, when a cantata by Ivar Hallström was sung; and Lindbad's *Die Frondeure* and scenes from Franz Berwald's *Estrella de Soria* were performed. The Solodovnikor Opera House of Moscow was destroyed by fire; the Opéra-Comique of Paris was also burned and the new building was inaugurated on Dec. 7. The Royal Theatre in Athens and the Emperor's Jubilee Theatre in Vienna were opened. A statue to Jenny Lind, by Christian Ericsson, was unveiled in the foyer of the new Royal Opera at Stockholm; the Internationale Stiftung Mozarteum placed a memorial tablet over the newly discovered grave of Leopold Mozart (died 1787), at Salzburg; a memorial, representing Tschalkowsky in his arm-chair, made by the sculptor Beklemischew, was placed in the St. Petersburg Conservatory; and a monument was placed on the grave of Jakob Stainer, the violin-maker, at Absom in the Tyrol.

Inventions.—One invention of the year was a new sound-board for the piano by Prof. Johannes Moser of Berlin. Contrary to custom, Prof. Moser makes his sound-board as rigid as possible, leaving the molecules of the wood to produce the vibration. The sound-board consists of two layers of wood, each $\frac{1}{2}$ inch thick, the surfaces of which are glued together but crossed at right angles to the grain. Towards the edges the thickness is reduced. The aim sought for is to have an equal tension throughout the sound-board.

Alessio Corradini, an Italian pianist, is said to have invented an harmonic string which preserves a given pitch and atmosphere cannot change its tension.

Gustave Lyon's chromatic harp without pedals was first heard in Paris played by Mlle. Aubert at the Society of Composers.

Il Mondo Artistico describes a "new colossal instrument made by Antonio Zibordi after fifteen years of work at Mirandola, near Modena, under the name of auto-electro-polyphone." This he will send to the Exposition of 1900.

London.—The opera season at Covent Garden under Maurice Grau was brilliant. Wagner's *Ring des Nibelungen* was given for the first time in its entirety. Felix Mottl conducted and many of the Bayreuth singers took part, including Jean and Edouard de Reszké, Marie Brema, Schumann-Heink, Dippel, Van Dyck, Nordica, and Eames. Mme. Cosima Wagner was present. The other singers included Calvé, Melba, Ternina, Ella Russell Saléza, Bonnard, Plancon, Gadski, Heglon, von Artner, Albers. Manchinelli and P. Flon were additional conductors. Among the operas given were *Hamlet*; Massenet's *Saffo*; Saint-Saëns's *Henry VIII.*; *Carmen*, *Faust*, *Roméo et Juliette*; *Tannhäuser*, *Tristan und Isolde*, *Il Barbiere*, *Rigoletto*, *Aida*, *Don*

Juan, Mancinelli's *Ero e Leandro*, and *Le Nozze di Figaro*. Particular success was achieved by Calvé as Marguerite in Boïto's *Mefistofele*.

London's musical season lasted eleven weeks, and as many as seventy concerts took place a week. Hans Richter conducted four orchestral concerts, at one of which he played Rimsky-Korsakoff's *Scheherazade*; Moritz Moszkowski appeared at the London Philharmonic, playing his new piano concerto; Saint-Saëns, Basoni, Mottl, Klindworth, Paderewski, Pachmann, and Rosenthal also appeared. Two Viennese pianists, Ella Pancara and Ilona Eibenschütz, were successful. In December the young Hungarian pianist, Dohnányi, astonished the London public. At his third recital a piano quintet in C was performed, a fine composition.

The famous conductor, Felix Weingartner, made his London début in June and played his symphonic poem *King Lear*. Adelina Patti, who became an English citizen, sang at Albert Hall; and Lady Hallé and Pachmann played the *Kreutzer Sonata* at a "Saturday Pop."

For the revival of Middleton and Rowley's *Spanish Gipsy* by the Elizabethan Stage Society at St. George's Hall, London, the music composed by Mr. Arnold Dolmetsch for the archaic instruments of harpsichord and viols was especially eloquent, fascinating and sympathetic. A critic said: "Understanding thoroughly as he did the limitations and the breadth of the power and spirit residing in those dumb strings, those dumb wires, he managed to restore the atmosphere of the past with a wonderful completeness and beauty of expression. The mock-sentimental ballad of the second act, 'O that I were a bee,' which by the way, Mr. Dolmetsch himself accompanied on an old Venetian lute of 1560, was extraordinarily subtle in its old contemporary humor, and the fortune-telling songs that came somewhat later had that odd suddenness and brevity of emotion which belongs to nothing modern or to anything that comes within a hundred and fifty years of modernity."

For *The Merchant of Venice*, played by the same society, Nov. 29, a piece for four viols by the ancient composer, Alfonso Ferrabosco, was performed.

The Handel Society revived Handel's *Belshazzar*, which contains some of his best work, and *Athaliah*. Coleridge-Taylor's new cantata, *Hiawatha's Wedding Feast*, for tenor solo, chorus, and orchestra, performed at the Royal College of Music, London, under Dr. C. Villiers Stanford, was highly praised, especially for the "grateful vocal writing." Herbert Bedford (husband of Liza Lehmann), had a symphonic prelude, *Kit Marlowe*, played at the Crystal Palace; Frederick Corder's dramatic scene, *Pippa Passes*, was played at the Philharmonic; an *Arabian Dance* for 'cello and orchestra, by J. Renard, became very popular at the Crystal Palace; *The Gate of Life*, by Franco Leoni, was sung by the Royal Choral Society, conducted by the composer; Clarence Lucas's *Othello* overture, at Queen's Hall, was praised for its "ingenious and picturesque treatment;" a quartet of clarinets was heard at Queen's Hall; César Franck's *Les Djinns*, for piano and orchestra, was played for the first time in London by Mrs. Henri Jossic; Sir Alexander Mackenzie finished a *Manfred Suite* for orchestra; and wrote a crooning "Willow Song" for Ellen Terry in *Othello*. Only one opera of any interest was produced in London, Sir Arthur Sullivan's *Beauty Stone*, libretto by Pinero and Comyns Carr.

Sir Edward Poynter, Alma-Tadema, Dr. C. Villiers Stanford, and Sir Henry Irving formed a committee to raise a monument to Brahms. A Folk-Song Society was organized in London to publish popular melodies. Otto Goldschmidt became president of the London Madrigal Society.

The Halle concerts of Manchester reached their 41st season and gave Beethoven's nine symphonies in regular order.

Paris.—In Paris great interest was manifested in a performance of *Fidelio* at the Opéra-Comique at which Rosa Caron sang Leonore and the experiment of musical recitatives by Gevaert were tried with success; Vincent d'Indy's opera, *Fervaal* created much discussion; Rousseau's *Cloche du Rhin* was among the new operas; Reynaldo Hahn's *Lile des Rêves* on Loti's story was represented at the Opéra-Comique; Saint-Saëns's *Dejanire* was also given; Massenet's *Thais* was given at the Opéra in a new form; Lacombe's *Quatre Fils Aymon* was also successful.

Pierné resigned as organist of Ste. Clotilde; Emma Nevada re-appeared at the Opéra-Comique; Felix Weingartner met with great success in Paris as conductor of Lamoureux's concerts and played his *King Lear* symphonic poem; Hollmann played in Paris a fantasie for 'cello and orchestra, which Massenet dedicated to him; and there was an interesting concert of Reynaldo Hahn's works.

Munich.—In Munich the success obtained at the Residenz-theatre by the model performances of Mozart's great works, according to their traditions and integral text encouraged Herr von Possart, the director, to complete the Mozart cycles. He gave some of the smaller works, such as *La Finta Giardiniera* (1775) and *Der Schauspieldirektor* (1786). He also gave a fine Wagner cycle. Mozart was in great favor in Germany this year. *Don Juan* was given 133 times and the *Magic Flute* nearly 200.

Maurel, Lehmann, Sembrich, Edouard de Reszké, and Nordica sang *Don Juan* in Berlin in the early winter.

Carlsruhe.—At Carlsruhe at the restoration of the Theatre Grand-Ducal, Mottl gave a fine series of operas. *Die Meistersinger*, *The Nibelungen Ring*, *The Magic Flute*, *Tristan and Isolde*, Glück's *Orphée*; Thuille's *Lobetanz*, Berlioz's *Beatrice et Bénédicte*, *La Prise de Troie*, and *Les Trojans à Carthage*, and Liszt's *La Légende de Sainte Elizabeth*. Berlioz's *Prise de Troie* and *Les Trojans à Carthage* were also given in Cologne.

Dresden.—In Dresden the Mozart Society celebrated the 25th jubilee of the King of Saxony by a performance of Bach's *Auf Schmetternde Töne der Muntern Trompeten*, written for the Elector Frederick August III in 1737. It is supposed that this was only its second performance.

Berlin.—A new society, the *Fafner Gesellschaft*, was founded in Berlin for the performance of manuscript works by living German composers; a woman's orchestra was founded in Berlin; and a choral society in Bayreuth under Kneisse to perform oratorios. Bach's *St. John's Passion* and Liszt's *St. Elizabeth* were given.

St. Petersburg.—St. Petersburg had a very brilliant opera season. The superb orchestra was directed by Krouchevsky, and Mme. Kamenskaya and Mme. Gorlenko Dolina were greatly admired. Sigurd Arnoldson became popular. Tschaikowsky's *Eugene Oneguine* was revived and created a sensation. Rimsky-Korsakoff completed the score of a new opera, *Mozart and Salieri*, on a libretto by Pushkin. Balakireff's new symphony in C major, op. 23, performed under the composer's direction in St. Petersburg, brought the following criticism: "It is Russian in vim and superbly orchestrated. The success was great and deserved."

Italy.—The great interest in Italy was the discovery of the Abate Perosi. To hear *La Resurrezione de Gesù Cristo* 700 persons assembled in Rome on Dec. 12. Perosi also wrote a funeral mass for Valerio Bana, which had great success in Turin. Another oratorio, *St. John the Baptist*, by Parodi, was successful in Genoa, and a new mass by the young composer, Ferdinando Petrilli, had a great success at the Cathedral of Poggia. Under Mascagni's direction a Requiem Mass by Lucidi was given at the Pantheon, Rome, for the 20th anniversary of Victor Emmanuel's death.

Mascagni's new opera, *Iris*, was given at Rome and his new symphony in memory of Leopardi, composed for the centenary at Recanati, was performed by 95 pupils of the Rossini Conservatory at Pesaro. For this symphony the composer received \$2,000. Giodano's *Fedora* produced in Milan was successful.

The Orchestral Society of La Scala, Milan, founded in 1874, and the Orchestral Society of Rome, founded twenty-five years ago by Ettore Pinelli were both dissolved.

Ballets in Vienna.—Vienna revived Glück's *Iphigenie en Aulide* and *Iphigenie en Tauride*, and had its quota of ballets, the most successful of which was Heuberger's *Opernball*, which made a tour of Germany. Von Suppé's posthumous opera, *Die Pariserin*, was discovered and performed with success. Müller's *Der Blondin von Namur*, Bayer's *Fräulein Hexe*, Mader's *She*, on Rider Haggard's novel, and Heuberger's *Struwwelpeter* also became popular. Other popular ballets were: Winzel's *The Press*, London; and Vidal's *Queen Fiametta*, Paris.

New York and America.—The musical season in New York was one of the most peculiar in its history. There was no regular opera season. The Damrosch and Ellis Opera Company gave a short season at the Metropolitan Opera House but the representations were poor and unsatisfactory. The best performance was that of Rossini's *Il Barbiere di Seviglia* with Melba, Campanari, and Carbone. There was an unusual number of concerts. A great blow was given to music by the sudden death on March 28 of Anton Seidl, a musician and conductor of peculiar genius and temperament. The Symphony Society disbanded on the retirement of Walter Damrosch. Deprived of her usual quota of foreign artists, New York was also deprived of song-recitals of the first rank and many fine concerts. Small concert companies sprang up through the country like weeds. The Damrosch and Ellis Opera Company travelled. Thomas travelled with his orchestra and Josef Hofmann remembered here as a child pianist. Ysaye and Pugno made an extensive tour; Guilmant, the French organist, gave recitals and travelled with his pupil, William Carl; and Gerardy, the young 'cellist, and Franz Rummel, Siloti, and Marteau also appeared. The Oratorio Society of New York, founded by Dr. L. Damrosch, celebrated its fifteenth anniversary with four concerts, at which Berlioz's *Damnation of Faust*, Horatio W. Parker's *St. Christopher*, *Elijah*, sung by Ffrancon Davies, and Dr. Damrosch's *Sulamith* were performed. Madeleine Schiller returned; Willy Burmester made his American début; Puccini's *La Bohème* was given for the first time in New York by the Royal Italian Grand Opera Co., in May; the Pittsburg Orchestra acquired a new conductor in Victor Herbert; the Mozart Club of Pittsburg reached its twenty-first season; the Chicago Orchestra its seventh under Theodore Thomas; the Handel and Haydn Society of Boston, under Zerrahn, sang *The Messiah*, *The Redemption*, and Bruch's *Arminius*; the *Caecilia*, under B. J. Lang, Bruch's *Odysseus*, and Humperdinck's *Pilgrimage to Kevlaar* (new).

A national congress of musicians was held at the Omaha Exposition with William Kimball director of the music. Compositions by E. A. Macdowell, Mrs. Beach, H. W.

Parker, Dudley Buck, E. Nevin, and E. S. Kelley were played. The Manuscript Society produced I. F. Bristow's choral symphony, *Niagara*, at Carnegie Hall in April. Liza Lehmann's *In a Persian Garden* (first performed in London, 1896), became extraordinarily popular throughout the country; the works of Strauss and Rimsky-Korsakoff were heard in various cities; the Kneisel Quartet played Arthur Foote's last work, a quintet, op. 38; Alexander Glazounow's Fifth Symphony was performed by the New York Philharmonic for the first time; and the Mendelssohn Glee Club, E. A. Macdowell, conductor, entered its 32nd season; Nevin's Suite after *Lorna Doone*, op. 10, and a folk-song by Rimsky-Korsakoff were the novelties. Theodore Thomas introduced Franck's *Chasseur Maudit* to Boston.

Of the ten novelties played by the Boston Symphony Orchestra, four were by Russians: Glazounow, *Poème lyrique*; Gernsheim, Violin concerto in D major; Loeffler, Symphonic Poem, *La Mort de Tintageles*; Massenet, music to *Les Erinnyes*; Paganini-Gorski, Caprice for violin in A minor; Rimsky-Korsakoff, overture to *La Grande Pâque Russo*, and his Symphony *Antar*; Strauss, Symphonic Poem, also *Sprach Zarathustra*; Stube, Concerto for violin; and Tschaïkowsky, Italian Caprice.

The Boston Symphony entered its 18th season under Gericke in the autumn; the New York Philharmonic was under Emil Paur; Frank Damrosch's Musical Art sang Bach's *Christmas Oratorio*; and Frank Damrosch inaugurated symphony concerts for children. The opera season opened Nov. 29, under Maurice Grau with the best and largest company ever brought to this country, including Sembrich, Jean and Edouard de Reszké, Lehmann, Schumann-Heink, Eames, Nordica, Van Rooy, Van Dyck, Dippel, Brema, Saléza, Plançon, Maurel, Campanari, Carbone, about 250 in all.

The Damrosch and Ellis Company in Philadelphia introduced Alvarez to America. Melba sang in San Francisco and the Apollo Club of San Francisco sang *Samson and Delilah*.

Festivals.—An important musical festival took place in Bergen from June 27 to July 3, under the direction of Grieg during the International Fishery Exhibition. The hall, built for the purpose, held 3,000 persons. There was a large orchestra assisted by the justly famous Amsterdam orchestra known as the *Concertgebouw* (Willem Mengelberg, conductor), and a chorus of 500 voices. This was the first gathering of Norwegian musicians, and the works of Norwegian composers only were given. Among the works performed were: Svendsen's *Symphony, No. 1, in D*; Halvorsen's orchestral suite, *Vasantasena*; a *Theme with Variations* for orchestra, by Catharinus Elling; Grieg's *Scenes From Olav Traygvason* (an unfinished play by Bjørnstjerne Bjørnson), for soli, chorus, and orchestra; *Zorahayda*, a legend for orchestra (on Irving's legend of the *Rose of the Alhambra*), by Svendsen; Grieg's *Concerto* for the piano in A minor; *Asgaardsreien*, a symphonic poem by Ole Olsen; an orchestral suite from the Yuletide play, *En Hellig Aften*, by Schjelderup; *Blaafjellet*, a piano suite played by the composer, Mme. Becker-Gröndahl; Ole Bull's *Saterjentens Søndag*; *March of the Turks Against Athens*, bass solo, male chorus, and orchestra by Johan Selmer; concerto for the piano in D major by Christian Sinding; *Huldredansen*, by Tellefesen and Neupert; Iver Holter's orchestral suite from Goethe's *Götz von Berlichingen*; and songs by H. Kjerulf, Rikard Nordraak, Eyvind Alnæs, J. Backer-Lunde, Per Winge, Otto Winter-Hjelm, Sigurd Lie, and Grieg. Among the singers was Mrs. Ellen Gulbranson of London and Bayreuth fame. A musical festival was held for three days at Verviers, the native town of Vieuxtemps, the great violinist, to whose memory a monument was unveiled.

The sixteenth centenary of the martyrdom of San Alessandro, the patron saint of Bergamo, took place there in August. Signor Emilio Pizzi had charge of the musical festival, and composed a mass and ode to the saint for the occasion.

There was also a musical festival of importance at Mayence by the Allgemeine Deutsche Musikverein, on the 25th-28th of June.

A special celebration took place in Berlin to honor Max Bruch's 60th birthday (his last choral work, *Gustav Adolf*, a cantata of large dimensions was sung under his bâton in Barmen on May 22); and there was a kind of opera-festival in Carlsruhe under Felix Mottl's direction from Sept. 9 to Oct. 16.

At the great fête at Béziers under the direction of Saint-Saëns in August that composer's new opera *Dejanire* was superbly represented in the open air theatre. The work had been rehearsed in Paris for a month; the chorus consisted of 200; the orchestra of 250; and there were 60 dancers. The work was represented in Paris, Nov. 11.

The Three Choirs held its 375th festival at Gloucester in the autumn with Hockett Brewer as conductor. The new works included Verdi's new religious pieces; an orchestral ballade by Coleridge-Taylor; Hubert H. Parry's *Song of Darkness*; Lee Williams's *Nunc Dimittis*, *Magnificat*, and *98th Psalm*; and Charles H. Lloyd's Festival overture. The *Messiah*, parts of *Judas Maccabæus*, and Sullivan's *Golden Legend* were also given.

The Leeds' Festival held in October was the most successful in many years; a large balance was left for medical charities and enough to organize a permanent orches-

tra. Among the works given were: Mendelssohn's *Elijah* and *Hymn of Praise*; Edwin Elgar's *Caractacus* (new); Stanford's *Te Deum*; Palestrina's *Stabat Mater*; Liszt's *Les Preludes*; Alan Gray's *Song of Redemption* (new); Handel's *Alexander's Feast* and ode by Otto Goldschmidt; new; Parry's *Blest Pair of Sirens*; Cowen's setting of Collins's *Ode to the Passions*; Gabriel Fauré's *Birth of Venus*, for chorus, soli, and orchestra; and Beethoven's *Ninth Symphony*. Humperdinck also conducted his *Moorish Rhapsodie* written for this festival.

The Royal National Eisteddfod was held in Wales; there was a festival of the Tonic Sol Fa in London consisting of 8,000 voices; and there was a grand festival concert at the Crystal Palace, London, June 25, with an orchestra of 500 and 3,000 voices, at which Edward Lloyd, Adelina Patti, Clara Bartt, and Charles Santley sang.

There were numerous festivals in America. At the Indianapolis festival Benoit's oratorio, *Lucifer*, was sung for the first time in America, by Bispham, Juch, Jacoby, and Gadski; Cincinnati had its 13th festival; Albany its 7th; Worcester its 41st; and Louisville, Springfield, Holyoke, and other towns. At the Eisteddfod contest at Salt Lake City the \$500 and a gold medal for the best choir was awarded to Prof. Stephens. The Montreal Philharmonic and the Sherbrooke Quebec choral society were the chief festivals in Canada.

Among the operas first represented in 1898 were:

Giordano's <i>Fedora</i>	Milan.
F. Cillo's <i>Arlesiana</i>	Milan.
Anzoletti's <i>La Fine di Mozart</i>	Milan.
Giannetti's <i>Il Violinista de Cremona</i>	Milan.
Collino's <i>La Creola</i>	Turin.
De Lara's <i>Moina</i>	Trieste.
P. Giovanni's <i>Castracane</i>	Naples.
Ferrari's <i>Il Cantico dei Cantici</i>	Milan.
Mascheroni's <i>Mal d'Amore</i>	Milan.
Brossi's <i>Il Cieco</i>	Venice.
Micel's <i>Attala</i>	Naples.
Tessaro's <i>Huss</i>	Treviso.
De Leva's <i>La Camargo</i>	Turin and Naples.
Bachini's <i>In Congedo</i>	Florence.
Tasca's <i>Pergolesi</i>	Berlin.
Lazzari's <i>Amor</i>	Prague
Alfano's <i>Fountain of Enschr</i>	Breslau.
Rimsky-Korsakoff's <i>Sadko of Novgorod</i>	Moscow.
Solowjeff's <i>Cordelia</i>	St. Petersburg.
Mascagni's <i>Iris</i>	Rome.
F. Neumann's <i>Assarpai</i>	Brunswick
Pembaur's <i>Zigeunerliebe</i>	Innsbruck.
Warnke's <i>Andalucia</i>	Kiel.
Hermann's <i>Wulfrim</i>	Cassel.
Kulenkempff's <i>Die Braut von Cypern</i>	Bremen and Cassel.
Sandberger's <i>Ludwig der Springer</i>	Stuttgart.
Thiulle's <i>Lobetanz</i>	Carlsruhe, Berlin, Mannheim.
Kienzl's <i>Don Quixote</i>	Berlin.
Massenet's <i>Saffo</i>	Milan.
Goldmark's <i>Die Kriegsgefangene</i>	Vienna.
Bungert's <i>Circe</i>	Dresden.
Lederer's <i>Hiob</i>	Hamburg
Scholz's <i>Ingo</i>	Frankfort.
Thierfelder's <i>Heirathstein</i>	Rostock.
Curti's <i>Rösli vom Santis</i>	Zurich.
Hummel's <i>Assarpai</i>	Gotha.
Diamanti's <i>Die Räuber</i> (Schiller)	Bologna.
Zumpe's <i>Farinelli</i>	Schwerin.
Fibich's <i>Sarka</i>	Prague.
Rozkosny's <i>Satanella</i>	Prague.
Zelinski's <i>Goplana</i>	Warsaw.
Moskowski's <i>Livia Quintilla</i>	Warsaw and Lemberg.
Stojanovitz's <i>Ninon</i>	Budapest.
Count Zichy's <i>Alar</i>	Berlin.
Sullivan's <i>Martyr of Antioch</i>	Edinburgh.
Sullivan's <i>Beauty Stone</i>	London.
Markham Lee's <i>The Bamboo</i>	London.
Julian Edward's <i>The Jolly Musketeers</i>	United States.
Arthur Bird's <i>Daphne</i>	United States.
Gorliff's <i>Queen of the Ballet</i>	United States.

Hahn's <i>L'Ile du Rêve</i>	Paris.
Rousseau's <i>La Cloche du Rhin</i>	Paris.
Vincent d'Indy's <i>Fervaal</i>	Paris and Brussels.
Hirschmann's <i>Lovelace</i>	Paris.
Raun's <i>Gætane</i>	Rouen.
Deffes' <i>Jessica</i>	Toulouse.
Bruneau's <i>Messidor</i>	Brussels.
Le Borne's <i>Hedda</i>	Milan.
Saint-Saëns' <i>Dejanire</i>	Béziers and Paris.
Erlanger's <i>Inez Mendo (Das Erbi)</i>	Hamburg and Frankfort.
Alfred Tofft's <i>Vifandaka</i>	Copenhagen.
Schytle's <i>Hero</i>	Copenhagen.
Nordermann's <i>King Magnus</i>	Hamburg.
Borch's <i>Silvio</i>	Christiania.
Stenhammer's <i>Tirfing</i>	Stockholm.
Lebelius's <i>Christian II</i>	Helsingfors.
Jan Blockx's <i>Princess d'Auberge</i>	Brussels and Ghent.
J. van der Eden's <i>Numantia</i>	Antwerp.
Enrique Granados' <i>Maria del Carmen</i>	Madrid.
Kunoth's <i>Frau Holle</i>	Kiel.
Orefice's <i>Il Gladiatore</i>	Madrid.

Among the one-act operas may be noted:

Eugen d'Albert's <i>Die Abreise</i>	Frankfort and Magdeburg.
Woyrsch's <i>Wickengerfahrt</i>	Hamburg.
Oechschege's <i>Kynast</i>	Altenburg.
Geisler's <i>Wir Siegen</i>	Posen.
Becker's <i>Ratbold</i>	Dresden and Mainz.
Hopfe's <i>Freijagd</i>	Barmen.
Rauchenecker's <i>Sanna</i>	Coblenz.
Hasselbach's <i>Junker Nachtigall</i>	Schwerin.
Chelius's <i>Hashish</i>	Prague, Carlsruhe, Coburg, and Weimer.

The choral works of 1898 include: Max Bruch's oratorio *Gustaf Adolf*, Barmen; W. Nicks' *Joseph Before Pharaoh*, Hildesheim; and S. de Lange's *Moses*, Stuttgart; and the chief cantatas were *Prometheus*, by Heinrich Hoffman, Leipzig; *Petrus Forschegründ*, by Schuchardt, Gotha; *Kassandra*, by Houck, Amsterdam; *Lanselot*, by H. Hutter, Coburg; and Fritz Volbach's *The Page and the King's Daughter*, four ballads for chorus and orchestra. The latter was exceptionally successful.

The following nine new symphonies met with favor:

	First Performance.
Cowen's in E major	Mannheim.
Kaspar J. Bischoff's in F minor	Mainz.
A. Klughart's in C minor	Dessau.
G. Mahler's in D major	Dresden.
F. Weingartner's in G major	Cologne.
W. Berger's in B major	Mainz.
Henry XXIV of Reuss's in A major	Münster.
Balakireff's in C major	St. Petersburg.
O. Pasch's in D major	Moscow.

Felix Draseke had a *Jubilee Overture* performed in Leipzig and Berlin; H. Grädner, *Variations for organ, strings, and trumpets*, Vienna; Carl Reinecke, a *Serenade for strings in G Minor*, Leipzig; Th. Müller-Reuter, a *Pastoral Suite*, Berlin; Hans Koessler, two *violin concertos*, Budapest and Vienna; Moritz Moskowsky: a new piano concerto in E major (four movements), London; Weingartner, a string quartet; Felix Mottl, a string quartet; G. Schumann, a piano quintet in B minor; and B. Köhler, a string sextet in A-flat major. Humperdinck's *Moorish Rhapsodie* was first played at the Leeds Musical Festival; and Richard Strauss's *Don Quixote Variations on a Theme of Chivalrous Character* at Cologne; and a new symphony; and J. Hollmann 2d 'cello concerto in A minor, Dresden. Grieg wrote some symphonic dances and a cycle of songs *Der Kind der Berge*, op. 67; Vincent d'Indy incidental music to *Medée* by Catulle Mendès. The last named composer's *Enchanted Forest*, César Franck's *Psyche* with chorus; Weingartner's *Fields of the Blest*; and Bruckner's Symphony in B flat major were novelties extensively played in Europe. Miss Ethel Smith's *Fantasio* was played by Felix Mottl in Carlsruhe, and the compositions of Margarite Flugge, of Cologne, called "the Paganini of the harp," attracted attention. Edmund de Mihalovich's symphonic composition, *La Mort de Pan*, was played in Budapest with brilliant success.

The following operas were novelties in the cities mentioned:

<i>Das Rheingold</i>	Brussels and Düsseldorf.
<i>Die Walküre</i>	Berne and St. Gall.
<i>Siegfried</i>	Worms.
<i>Die Götterdämmerung</i>	Elberfeld and Bologna.
<i>Tristan und Isolde</i>	St. Petersburg.
<i>Die Meistersinger</i>	Buenos Ayres.
<i>Tannhäuser</i>	Alexandria (Egypt).
Verdi's <i>Otello</i>	Dresden and Stuttgart.
Berlioz's <i>Troycens</i>	Cologne.
Goldmark's <i>Queen of Sheba</i>	Antwerp and Trieste.
Goldmark's <i>Cricket on the Hearth</i>	Weimar and St. Petersburg.
Rubinstein's <i>Feramors</i>	St. Petersburg.
Rubinstein's <i>Nero</i>	Barcelona.
Delibes's <i>Le Roi l'a dit</i>	Budapest.
<i>Trumpeter von Sackingen</i>	Lemberg.
St. Saëns' <i>Samson et Delilah</i>	Madrid and Buenos Ayres.
St. Saëns' <i>Henry VIII</i>	London and Ghent.
Tschaikowsky's <i>Eugene Onéguine</i>	Berlin and St. Petersburg.
Massenet's <i>Manon</i>	Rome, Amsterdam, Stuttgart and Wiesbaden.
Mascagni's <i>Ratcliff</i>	Amsterdam, Turin and Düsseldorf.
Leoncavallo's <i>La Bohème</i>	Vienna, Cassel and Presburg.
Pucini's <i>La Bohème</i>	Paris and New York.

Death robbed the world of Anton Seidl, one of the greatest conductors and musicians of the century; of the famous tenor Max Alvary, the son of the painter Achenbach, whose talent matured in New York, and who created the part of Siegfried here, and who will always be the ideal figure of this opera; Edouard Remenyi, the Hungarian violinist, who spent his last years in New York; A. Neuendorf, a German conductor, well-known in New York and other American cities; Diego de Vivo, an impresario, associated with the opera in the days of Irving Place; Signor Nicolini, the tenor and husband of Adelina Patti; Carvalho, the Parisian director; Emil Hartmann, the Norwegian composer for the flute; Conrad Behrens, an opera singer familiar to New Yorkers; S. B. Mills, who died in Wiesbaden.

An influential musical figure, little known on our side of the globe, also passed away at Smyrna, A. Dicran Tchouhadjian, called "the Verdi of the Orient." He was a native of Constantinople and published many compositions, including an opera, *Leblébidji Horhor*, which had a marvellous vogue in Constantinople, Smyrna, Athens, Roumania and Egypt. He also wrote *Arif and Zemire*. He was about to settle in Paris, when death surprised him at the height of his powers.

MUSIC CLUBS, FEDERATION OF, an organization which owes its origin to the initiative of Mrs. Theodore Sutro, at the nineteenth annual convention of the Music Teachers' National Association (q. v.), held in New York June 24-28, 1897. Fifty-four clubs represented there formed a nucleus for the federation of women's music clubs, the first annual meeting of which was held at Steinway Hall, in Chicago, in January, 1898, when the society was legally incorporated with Mrs. Sutro as its first president.

MUSIC TEACHERS' NATIONAL ASSOCIATION held its 20th convention at the Waldorf-Astoria, New York, June 23-27, 1898. Papers on musical topics were read, including one on voice-culture, by F. W. Wodel, of Boston. Herbert W. Greene, President; James Potter Keough, Secretary.

MYCENÆAN CIVILIZATION. See ARCHÆOLOGY (paragraph Greece).

MYSTIC CIRCLE, a fraternal society founded in 1884, has 9 grand rulings, 365 subordinate rulings, and 12,181 members. It has disbursed \$1,186,888 and in the last fiscal year \$173,250. Supreme Mystic Ruler, D. E. Stevens, Philadelphia, Pa.; Recorder, W. H. Snyder, Philadelphia.

NAPIER and **ETTRICK**, FRANCIS NAPIER, Lord, K. T., LL. D., retired English Ambassador, died December 18, 1898. He was born at Thirlstane, September 15, 1819; was educated at Trinity College, Cambridge, and entered the diplomatic service in 1840 as attaché at Vienna and subsequently acted in a similar capacity at Teheran and Constantinople, becoming in 1846 Secretary of Legation at Naples. In 1848-49 he was chargé d'affaires at Naples and in 1852 assumed the same duties at St. Petersburg. Two years later Lord Napier was appointed Secretary of Embassy at Constantinople and in 1857 was advanced to the post of Minister to the United States, he then was appointed Minister successively to The Hague (1858), Russia (1860), Prussia (1864). In 1861 he became a Privy Councillor and in 1864 was made a Knight of the Order of the Thistle. From 1866 to 1872 he was Governor at Madras; in the latter year he was made Baron Ettrick of Ettrick and for a few months in

the spring was Viceroy *pro tempore* of India. Baron Napier was a member of the Church of England and a Unionist in politics.

NATAL lies on the eastern coast of South Africa to the north of Cape Colony and has an area of about 20,461 square miles with a population in 1891 of 543,913, of whom 455,983 were Kaffirs and the remainder were about equally divided between Europeans and Indians. Its capital and seaport is Durban, with a population estimated in 1895 at 38,877, and next to this is the town of Pietermaritzburg, with a population estimated in 1895 at 20,155. It has a seaboard on the Indian Ocean of about 200 miles. Agriculture is the principal occupation of the inhabitants and the chief crops are sugar, maize, wheat, oats, and other cereals and vegetables. Tea-planting is also carried on and the raising of live stock is important. As to mineral resources the coal fields are especially valuable, and attempts have recently been made to develop the rich beds of iron ore which have been discovered. The trade has increased steadily during the last seven years. The statistics of the commerce for the year 1897 were published in the United States Consular Reports for September 1898. These show an increase in the value of imports from \$26,463,355 in 1896 to \$29,119,136 in 1897. The exports, however, fell off from \$8,688,527 in 1896 to \$7,893,132 in 1897, the decrease in the value of the colonial products being attributed to the rinderpest, locusts, and drought. In 1897 nearly two-thirds of the total import trade was with the United Kingdom. The revenues of the colony have increased in the last seven years and the returns for 1897 showed an increase over those of 1896. The chief items of revenue have been railways, customs, mails, land sales, telegraphs, excise, stamps, and licenses, and the native hut tax, and the principal items of expenditure have been railways, public works, and defense. Education is aided by the government and has made considerable progress. It is said that about 96 per cent. of the number of white children are in attendance. There are over 400 miles of railway in operation in the colony. Order is maintained by means of a body of mounted police numbering about 490 Europeans and some 1,400 volunteers, and there is a small volunteer naval corps.

Natal was colonized in 1824 by Englishmen. The Boers tried to seize the territory, but were driven out by the Zulus. The land was afterwards annexed to Cape Colony, but in 1856 became a separate colony under the British Crown, which has since 1882 been represented there by a Governor. The present constitutional charter dates from 1893. By this legislative authority is vested in the Queen, a legislative Council and a legislative Assembly; and the executive authority in the Governor whose assent is required to all legislative enactments. The eleven members of the legislative Council are appointed by the Governor with the advice of his Ministers. The legislative Assembly with 37 members is chosen by the electors. The Ministers include the Premier and Colonial Secretary; the Attorney-General and Minister of Education; the Minister of Public Works, the Minister of Native Affairs, and the Colonial Treasurer. In 1898 the Governor was Sir Walter Francis Hely-Hutchinson. Among the political questions which have recently agitated the colonists is the matter of importing Indians into the country. This has occasioned popular discontent which in 1897 seemed to threaten a resort to force to prevent the landing of immigrants. During that year legislation in restraint of immigration was under discussion.

NATIONAL ACADEMY OF DESIGN was founded in 1826 with thirty members. It was an outgrowth of the New York Drawing Association, established in 1825. Its regular exhibitions are: The autumn exhibition in November and December, the water-color exhibition in February, and the annual exhibition in April and May. Prizes: Thomas B. Clark prize of \$300, for the best figure composition; the Julius Hallgarten of \$300, \$200, and \$100, for the best three pictures in oils; and the Norman W. Dodge of \$300, for the best picture by a woman. Only Americans are eligible. There is also a good department of schools under its control. President, Thomas W. Wood; Corresponding Secretary, J. Carroll Beckwith.

NATIONAL ACADEMY OF SCIENCES, incorporated 1863 by act of Congress. Whenever called upon by any department of the government it was to investigate, examine, experiment, and report upon any subject of science or art; to be paid by special appropriations. There are 87 members, 1 honorary member, and 27 foreign associates. President, Wolcott Gibbs, Newport, R. I.; Foreign Secretary, Alex. Agassiz, Cambridge, Mass.; Home Secretary, Ira Remsen, Baltimore, Maryland.

NATIONAL ARTS CLUB, founded in 1898, has now a membership of 971. George B. Post, President.

NATIONAL ASSOCIATION OF DEMOCRATIC CLUBS, organized in 1888, consists of 750,000 members. President, Chauncey F. Black, York, Penn.; and Secretary, Lawrence Gardner, Washington, D. C.

NATIONAL ASSOCIATION OF NAVAL VETERANS, organized in 1887, "to cherish the memory and associations of the war of the late rebellion, to perpetuate the glorious names and deeds of our navy, to strengthen the ties of fraternal fellow-

ship and sympathy, to advance the best interests of this association, and to extend all possible relief to the widows and orphans of members; to foster the cultivation of naval science; to encourage the building of an efficient navy and national defenses; to enforce unqualified allegiance to the general government; to protect the rights and liberties of American citizenship, and to maintain national honor, dignity, union, and independence." There are 39 local associations, a paid membership exceeding 7,500 and 3,000 contributing members. Rear-Admiral Commanding, J. F. R. Foss, Minneapolis; Fleet-Secretary, Frederick E. Haskins, 767 Washington ave., Brooklyn, N. Y.

NATIONAL DENTAL ASSOCIATION, organized in 1897 to cultivate dentistry, has 350 members. President H. T. Burkhart, Batavia, N. Y.; Secretary, Emma Eames Chase, St. Louis. The society will meet at Niagara Falls in August 1899.

NATIONAL ECLECTIC MEDICAL ASSOCIATION, organized in Cincinnati, O., May 25, 1848; reorganized at Chicago, Sept. 27, 1870. Delegates are appointed by local and State societies. Next annual meeting at Detroit, Mich., in June 1899. President, David Williams, M. D.; Secretary, P. E. Howes, M. D., 58 Birch (Ros.). Boston, Mass.

NATIONAL FARMERS' ALLIANCE AND INDUSTRIAL UNION is an outgrowth of the Grange, or Order of Patrons of Husbandry, founded in 1867. The first Farmers' Alliance appears to have been organized in Lampasas county, Texas, in 1876, by W. T. Baggett, who also organized a State Alliance in 1879. The platform adopted in 1886, stated that the objects of the organization were: (1) "To labor for the education of the agricultural classes, in the science of economical government, in a strictly non-partisan spirit; (2) to endorse the motto 'In things essential, unity, in all things, charity; (3) to develop a better State, mentally, morally, socially, and financially; (4) to create a better understanding for sustaining civil officers in maintaining law and order; (5) to constantly strive to secure entire harmony and good-will among all mankind and brotherly love among ourselves; and (6) to suppress personal, local, sectional, and national prejudices, all unhealthy rivalry and all selfish ambition." At a meeting held in Waco in 1887, this society was united with the Farmers' Union (an association of Louisiana farmers). In 1888 it joined with the Agricultural Wheel (which had originated in 1882), at Meridian, Miss., and chose the name, Farmers' and Laborers' Union of America. In 1889, at St. Louis, it changed its name to National Farmers' Alliance and Industrial Union. The union is in operation throughout the United States and Territories. It demands a national currency "safe, sound, and flexible," and a graduated income tax; that no one industry shall be built up at the expense of another; that the government shall establish postal savings-banks for the safe deposits of the savings of the people; and that no land "shall be held by corporations for speculative purposes, or by railroads, in excess of their needs as carriers, and all lands now owned by aliens should be reclaimed by the government and held for actual settlers only." President, W. A. Gardner, Andrew's Settlement, Pa.

NATIONAL GALLERY OF BRITISH ART, Milbank S. W., was opened by the Prince of Wales in 1897. The site is the old Milbank prison. It was the gift of Sir Henry Tate to the British nation, and he is now extending the galleries (which he built) at his own expense. Director, Sir E. J. Poynter; Keeper, Mr. Charles Holroyd.

NATIONAL GALLERY, Trafalgar Square, London, is the principal art gallery of the British nation. The nucleus for which consisted of thirty-eight pictures (the Angerstein collection), purchased in 1824 for £57,000. The present building, finished in 1838, was enlarged in 1861, 1869, 1876, and 1887. The collection now occupies more than twenty-two rooms, and contains superb examples of Raphael, Rembrandt, Vandyck, Velasquez, Rubens, Holbein, Correggio, etc., while, of course, it contains the masterpieces of British artists. Sir Edward John Poynter, Director; Hawes Turner, Keeper and Secretary. See E. T. Cooke's *Guide to the National Gallery* (London, 1888).

NATIONAL GEOGRAPHIC SOCIETY of Washington, D. C., organized in 1888 for the increase and diffusion of geographic knowledge, holds 3 regular courses of popular illustrated lectures; publishes an illustrated monthly, *The National Geographic Magazine*, and holds an annual excursion and field meeting every May. There are 14 honorary, 26 life, 390 corresponding, and 1,030 active members. President, Dr. Alexander Graham Bell.

NATIONAL GRANGE, an association of farmers, organized in 1866, favors reforms beneficial to farmers in regard to postal savings-banks, enactment of food laws, rural free mail delivery, additional powers to the Interstate Commerce Commission, speedy construction of the Nicaragua Canal, laws to prevent the pooling of railroads, investigation of foreign trade relations, election of U. S. Senators by popular vote, and settlement of international disputes by arbitration. There are 27,689 subordi-

nate granges throughout the U. S. Master, Aaron Jones, South Bend, Ind.; Secretary, John Trimble, 514 F. street, Washington, D. C.

NATIONAL LEAGUE FOR GOOD ROADS, organized in 1892 to awaken interest in the improvement of public roads. President, Gen. Roy Stone, Washington, D. C.; General Secretary, Charles F. Johnson, San Francisco, Cal.

NATIONAL LEAGUE OF MINERAL PAINTERS, organized in 1892, has 400 members. President, Mrs. Worth Osgood; Secretary, Miss Kate Horlocker, 28 East 23rd st., New York.

NATIONAL MUNICIPAL LEAGUE, organized in 1894, is composed of 110 associations formed in various cities in the U. S. to improve municipal government. President, James C. Carter, New York; Secretary, Clinton Rodgers Woodruff, 514 Walnut st., Philadelphia.

NATIONAL MUSEUM. See ANTHROPOLOGY.

NATIONAL PORTRAIT GALLERY (Edinburgh). See PAINTING (paragraph Exhibitions).

NATIONAL PORTRAIT GALLERY, Trafalgar Square, founded in 1856, at South Kensington, on a motion of Earl Stanhope in the House of Lords "for the exhibition of portraits of eminent British historical characters." In 1885 it was removed to Bethnal Green Museum, and in 1896 the new building constructed by Mr. W. H. Alexander was opened. There are now nearly 1,200 portraits and busts. Lionel Cust, Director, Keeper, and Secretary; James D. Milner, Clerk and Acting Assistant Keeper.

NATIONAL PROVIDENT UNION, a fraternal society, founded in 1883, has 73 sub-councils and 3,275 members. Since 1883 it has disbursed \$1,567,807 and \$115,800 during its last fiscal year. President, James Younie, Brookline; and Secretary, H. L. Carr, Brooklyn.

NATIONAL REPUBLICAN LEAGUE OF THE UNITED STATES, organized in New York in 1887 by delegates from 250 Republican Clubs. It aims to extend the Republican party in every way. Yearly conventions have been held in Baltimore, Nashville, Cincinnati, Buffalo, Louisville, Denver, Cleveland, Milwaukee, Detroit, and Omaha in 1898. President, George N. Stone, San Francisco; Secretary, D. H. Stine, Newport; headquarters Auditorium Hotel, Chicago.

NATIONAL SCULPTURE SOCIETY, incorporated in New York in 1896, is composed of lay and sculpture members. Its aim is to encourage good sculpture for museums, public parks, squares, buildings, etc., and to provide exhibitions of worthy works. President, J. Q. A. Ward; Secretary, Bar Feree, 112 Wall street, New York.

NATIONAL SOCIETY OF NEW ENGLAND WOMEN, organized in 1895, consists of 550 members. President, Mrs. William Gerry Slade; Secretary, Miss Mabel Sutton, 119 W. 126th street, New York.

NATIONAL SOCIETY OF THE SPANISH-AMERICAN WAR, organized August 12, 1898. Its main purposes were the building of a monument to the heroic dead of the Spanish-American War, the creation of a fund for memorial lectures, and the fostering of patriotism, and training of youth in good citizenship. Membership is open to all patriotic Americans, both men and women. The motto of the society is "Lest We Forget." Headquarters are in Baltimore, Md. Honorary President, Clara Barton; Honorary Vice-Presidents, Mrs. John A. Logan, Rear-Admiral W. S. Schley, Maj.-Gen. Nelson A. Miles, and others; Secretary, Hildegard H. Langsdorff, Carlisle, Pa. There is also an Executive Council.

NATIONAL SPIRITUALISTS' ASSOCIATION. See SPIRITUALISM.

NATIONAL UNION, ORDER OF, a fraternal society dating from 1881, with 760 sub-councils and 46,817 members. Total benefits disbursed \$9,698,417, during the last fiscal year \$1,239,470. President, H. H. Cabaniss, Atlanta, Ga.; Secretary, J. W. Myers, Toledo, Ohio.

NATIONAL WOMEN'S CHRISTIAN TEMPERANCE UNION was organized in Cleveland, Ohio, in 1874. In 1898 work was in behalf of kindergarten, school savings banks, anti-narcotics, and unfermented wine at sacrament; and among railway employees, soldiers, sailors, lumbermen, miners, and others. Its headquarters are in Chicago. There are 44 distinct departments of work. The white ribbon is the badge.

In 1898 there were 10,000 local unions and legions and a membership of half a million. The total receipts were \$24,297.55, expenditures, \$23,207. The twenty-fifth annual meeting was held Nov. 11 to 16, 1898, at St. Paul, Minn. Miss Francis E. Willard, its President since 1879, died in February 1898. The officers elected Nov.

15, 1898, are: Mrs. Lillian M. N. Stevens of Maine, President; Miss Anna A. Gordon, Vice-President-at-Large; Mrs. Susannah M. D. Foy, Cor. Secretary; and Mrs. Clara C. Hoffman, Recording Secretary.

NATURAL GAS. The geological and geographical distribution of natural gas is far greater than any one imagined it would be, when this kind of fuel was first discovered. The productive horizons cover the entire paleozoic series of rocks, but two distinct types of accumulation can be recognized, namely, the occurrence of natural gas in impervious rocks such as shales and most limestones, and in porous rocks such as sandstone. The former type is known as shale gas, and the latter as reservoir gas. Shale gas occurs in rather small wells, which do not show uniform pressure, it is not confined to definite horizons, and is not necessarily associated with petroleum; furthermore it has staying qualities, and does not depend upon the structural arrangement of the strata, which contain it. Reservoir gas on the other hand is found in great wells, often accompanied by oil, and while the rock pressure is quite constant, in any one area, at the same time these wells generally give out suddenly. In a report recently issued by Prof. Orton, these data concerning gas, wells have been advanced, and a promising gas field of Iola, in southeastern Kansas, has also been described. The source of the gas is a sandstone of the Cherokee shale formation, near the botton of the coal measures. The largest well of the field produces 10,000,000 cubic ft. per day, and the gas is being used in enormous quantities and very advantageously commercially, to supply the smelters of Joplin, Mo., in the reduction of lead and zinc ores.

NAVAL ORDER OF THE UNITED STATES was organized in Boston, in 1890. The General Commandery was established three years later. Officers and descendants of officers who served in the U. S. Navy or Marine Corps in any war or battle are Companions of the Order. There are two classes of members: (1) Veteran officers and their male descendants; and (2), enlisted men who have received the U. S. medal of honor for bravery in action. The Naval Order of the United States is composed of a General Commandery and Commanderies in New York, Massachusetts, Pennsylvania, Illinois, and the District of Columbia. General Commander, Rear-Admiral John G. Walker; Capt. General-Recorder, Henry H. Bellas, Germantown, Pa.

NAVIES, FOREIGN. England's budget for 1897-98 provides for expansion in all branches, and amounts to about \$107,000,000. In 1895 the number of officers and men was 88,550; this has been increased and in 1897 included 100,050 men. The ships under construction or to be built during 1897-98 numbered 108, including 14 battleships, 8 first class cruisers, 9 second class cruisers, 10 third class cruisers and 52 torpedo boat destroyers. Russia is rapidly adding to her navy, and is wisely fitting up harbors and channels for strategical purposes. It is stated that in 1896 the naval program involved the expenditure of \$318,000,000. France in her naval estimates included \$55,108,000, of which about \$20,000,000 is for new ships. The present building plan extends over a period of eight years, and calls for the expenditure of \$144,300,000.

The following tables show the relative strength of several of the world's navies in May 1897, as regards fast cruisers:

Available.	Triple			
	England.	Alliance.	Russia.	France.
First class cruisers.....	24	3	5	8
Second class cruisers.....	61	26	7	12
Dispatch boats.....	50	19	20	13
Torpedo boats, and torpedo boat destroyers....	51	38	9	13
	<hr/>	<hr/>	<hr/>	<hr/>
	195	86	41	46

Under Construction.	Triple			
	England.	Alliance.	Russia.	France.
First class cruisers.....	12	10	6	5
Second class cruisers.....	6	3	1	7
Dispatch boats.....	10	5	..	1
Torpedo boats, and torpedo boat destroyers....	14	1	1	3
	<hr/>	<hr/>	<hr/>	<hr/>
	42	19	8	16

In the same year France had in addition 10 battleships and 7 armored cruisers under construction. Of all classes she had 63 warships under construction. -In Germany a program formulated in 1873 is being carried out. This calls for an active

fleet of 17 battleships, 8 armored coast defense ships, 9 large cruisers and 26 small cruisers. The total number of warships proposed and available is shown in the following table:

	Authorized.	Available.
Battleships	19	12
Armored coast defense.....	8	8
Large cruisers.....	12	10
Small cruisers.....	30	23
	—	—
	69	53

The German government provides for the replacement of old type ships by fixing the period of efficiency of battleships and armored coast defense ships at 25 years, large cruisers 20 years and small cruisers 15 years. The number of men connected with the German navy in all capacities is being gradually increased, and in 1904 the number will be about 26,637. For an account of the naval strength of other powers see the articles on the United States and other countries.

NAVIGATION. The decay of the American merchant marine has been a topic of discussion for many years. Several projects for improving the condition of American shipping have been received with more or less favor. For an account of the proposals made by Secretary Gage in his report of Dec. 6, 1898, see UNITED STATES (paragraph Navigation).

NEBRASKA, a central western State of the United States, has an area of 77,510 sq. m. Capital, Lincoln.

Mineralogy.—The principal mineral resources of commercial value are clay and limestone. Of the former, manufactured products in 1897 had a value of \$355,365, principally brick and tile, and of the latter there was an output valued at \$42,359. See ARTESIAN WELLS, and FULLER'S EARTH.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 158,754,666 bushels, value, \$34,926,027; wheat, 34,679,309, \$16,299,275; oats, 56,245,042, \$11,249,008; barley, 1,092,320, \$273,080; rye, 1,104,650, \$375,581; buckwheat, 68,774, \$41,952; potatoes, 9,148,425, \$3,384,917; and hay, 3,223,379 tons, \$10,637,151—total value, \$77,186,991. The State ranked third in production of corn, fifth in oats, and sixth in hay. Live-stock comprised, horses, 652,284; mules, 43,016; milch cows, 628,750; other cattle, 1,395,829; sheep, 292,779; and swine, 1,353,671—total head, 4,266,329.

Banks.—On Oct. 31, 1898, there were 102 national banks in operation and 64 in liquidation. The active capital aggregated \$10,125,000; circulation, \$2,769,458; deposits, \$33,360,946; reserve, \$12,199,901. The State banks, July 14, 1898, numbered 390, and had capital, \$7,601,204; deposits, \$17,669,231; resources, \$27,158,106. The exchanges at the U. S. clearing-houses at Omaha, Lincoln and Hastings, in the year ending Sept. 30, 1898, aggregated \$320,399,676, an increase of \$80,025,340 in a year.

Education.—At the close of the school-year 1896-7 there were 354,929 persons of school age in the State, of whom 266,275 were enrolled in the public schools and 171,442 were in daily attendance. There were 6,695 public school houses; 9,347 teachers; public school property valued at \$8,822,340; and expenditures, \$3,421,247, including \$2,390,018 for teachers' salaries. For higher education there were 219 public high schools; 15 private secondary schools; a public and 4 private normal schools; 11 colleges and universities, with 181 professors and instructors, 2,702 students, and \$258,315 income; and 3 theological, 1 law, and 3 medical schools. The agricultural and mechanical departments of the State University, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. To complete the State system of free education the legislature enacted that pupils might attend high schools in a county not their own when more convenient, on the payment of a tuition fee of 50 cents per week for each pupil by his own county; but in 1897 the Supreme Court declared the law unconstitutional. In 1898 there were 599 periodicals, of which 31 were dailies, 522 weeklies, and 28 monthlies.

Finances.—The total assessed valuation of property was \$165,193,736 in 1897 and \$167,830,822 in 1898. On Sept. 1, 1898, the aggregate bonded debt was \$153,267; amount of general fund warrants outstanding, \$1,538,642. The State tax levy in 1897 was \$1,183,069; appropriation by the legislature for 1897-99, \$2,335,843.

Nebraska has entered upon a great era of prosperity. Farming and agriculture were profitable during 1898. The results are best shown in the mortgage record. There was an excess of mortgages satisfied over those filed for 1898 of more than \$50,000,000. The majority of these show cash considerations in satisfaction. A considerable sum represents various branches of business, but the great bulk of these mortgages was paid off by the agriculturalists and stock-raisers.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 1,410,000. A local estimate gave Omaha 155,000.

The Nebraska Maximum Decision.—The interesting affair of the year was the decision rendered by Justice Harlan in the U. S. Supreme Court in Washington on the Nebraska Maximum freight case, pronouncing the Nebraska statute unconstitutional and invalid. This law was passed April 12, 1893, and provided among other things that all freights should be classified in a certain form and that reasonable maximum freight rates should be fixed on the State railroads. The law was contested by the Union Pacific, St. Joseph and Grand Island, Omaha and Republican Valley, and the Kansas City and Omaha. The railroads claimed that this law would make a difference of \$2,250,000 annually to the earnings of the roads in Nebraska. As the law just nullified was a Populist measure the leaders demand that another freight law shall be passed. The matter was warmly discussed throughout Nebraska.

Elections and Officials.—The State elected her Democratic-Populist governor with a plurality of 2,721 votes. The Nebraska Republicans were unusually industrious, but the Fusionists were victorious. Nebraska's Representatives are: John S. Robinson (Dem.), from Madison; E. J. Burkett (Rep.), from Lincoln; David H. Mercer (Rep.), from Omaha; William L. Stark (Rep.), from Aurora; R. D. Sutherland (Rep.), from Nelson; and William L. Greene (Rep.), from Kearney. Senators: John M. Thurston (Rep.), from Omaha; and another Republican. State officials: William A. Poynter, Governor; E. A. Gilbert, Lieutenant-Governor; W. F. Porter, Secretary; J. B. Meserve, Treasurer; J. F. Connell, Auditor; C. J. Smythe, Attorney-General; P. H. Berry, Adjutant-General; W. R. Jackson, Superintendent of Education; and S. Lichty, Commissioner of Insurance. All are Populists except Gilbert (Sil. Rep.), and Smythe (Dem.). Chief Justice, T. O. C. Harrison (Rep.); Associates, T. L. Norvel (Rep.), and J. J. Sullivan (Fusion); Clerk, D. A. Campbell (Rep.). The State legislature consists of 16 Democrats, 73 Republicans, and 44 Populists.

NEGRO PROBLEM. The results arising from the enfranchisement of the southern Negro, which for a long time have been recognized as being very grave, on several occasions in 1898 presented most serious difficulties. There seems to be little disposition on the part of the whites to interfere with the Negroes so long as the latter are content to observe their social inequality and to refrain from anything like attempted domination in politics. Throughout the south a large portion of the population is black and in many counties there is a Negro majority. Race antagonism is increased by the fact that the Negroes are almost solidly Republican. While it is true that they have made great progress since the Civil War, it is also true that as yet very few of the blacks are competent to hold public office; however, of late they have been clamoring for local offices and for a representation in Congress proportionate to their population. The lessons of the year make it very evident that the majority of these Negroes, as well as many of the "poor whites," should be disfranchised by educational requirements as soon as possible. In October 1898, there were several shooting affairs, lynchings, and murders, arising from race feeling, in North Carolina, Tennessee, Alabama, Mississippi and Texas; and it was readily foreseen that further troubles on election day were impending. The whites were becoming exasperated at Negro aspiration to office, at the arrogance of Negroes who had been elected to official position in some counties where there is a black majority, and at Federal appointments of Negroes to office. The most serious eruption occurred in North and South Carolina at election time. In these cases both sides have been alike condemned and defended; it is difficult to give a just and impartial presentation of the troubles, but it seems safe to say that neither party was without fault. See NORTH CAROLINA and SOUTH CAROLINA (paragraph Race Troubles).

NEON. This is another new element from the air which was discovered by Prof. Ramsay and Mr. Morris Travers. It was found in liquid air at the same time that krypton was isolated and is found nearly always in close combination with another element also new, which they propose to call metargon. A quantity of argon having been liquefied, a colorless fluid was formed, from which a considerable quantity of solid substance was found to separate. A gas also remained which on further examination was found to be neon, the solid substance being metargon. Neon is probably of the most interest since it promises to be the missing link between argon and helium. See METARGON, KRYPTON, and XENON.

NETHERLANDS, THE KINGDOM OF THE, is bounded on the north and west by the North Sea and on the east by Germany. It has an area of 12,648 sq. m., with a population on December 31, 1896, of 4,928,658, and according to a later estimate, of 5,004,204. It is densely populated, the number of the inhabitants per square mile on December 31, 1895, being 384. The population is steadily increasing and is now about double what it was at the census of 1829. This increase is due to excess of births and not to immigration, nor is emigration important. Comparatively few of the Dutch leave their native soil to take up their abode in foreign countries. In the twelve months ending June 30, 1898, the United States Commissioner of Immigration

reported only 774 immigrants to the United States from the Netherlands. The seat of government is The Hague with a population on December 31, 1896, of 191,530, but the chief city is Amsterdam, with a population of 494,189 and next is Rotterdam with 286,105 inhabitants. Other large cities are Utrecht, Groningen, Haarlem, Arnhem and Leyden. Internal communication is afforded chiefly by the waterways, canals being more numerous than in any other European country. The railway system comprised in 1896 about 1,700 miles of which more than one-half was owned by the State. The chief crops are rye, potatoes, oats, wheat, buckwheat, beans, beet root, barley, etc., but the Netherlands import a large quantity of the cereals. The statistics of 1896 show that there were 537 distilleries, 499 breweries, 10 sugar refineries, 30 beet root sugar refineries, 92 vinegar manufactories and 49 salt works in operation. In the same year there were 4,975 steam engines employed in manufactures. The herring fishery is of special importance, its products being valued in 1896 at 4,924,879 guilders.

Commerce.—The commercial importance of the country is very great. It is substantially a free trade country, the duties amounting to only 5 per cent. ad valorem and if the imported articles are used in the industries of the country the tax is reduced to 2½ per cent. or remitted altogether. In respect to importance of commerce with the Netherlands, Prussia stands at the head of all nations dealing with that country. In 1896 the value of imports from Prussia was 17 per cent. of the whole and the value of exports to Prussia was 50.7 per cent. The countries next in importance were Great Britain, Belgium, the United States and Russia. The trade with the Dutch East Indies is also very important, the value of imports being 14.06 per cent. of the total for home consumption in 1896. During the year ending June 30, 1898, the Netherlands imported from the United States goods to the value of \$64,274,622 and exported to the United States goods to the value of \$12,535,110. The merchant marine of the Netherlands at the end of the year 1896 included 440 sailing vessels with a tonnage of 98,766 and 172 steamers with a tonnage of 196,824. The tonnage of vessels that entered the ports of the Netherlands in 1896 was 7,905,174 and the tonnage of vessels cleared 7,735,254. In respect to tonnage the most important port is that of Rotterdam, which received 59.4 per cent. of the total tonnage of vessels entered. Next in importance is Amsterdam with 15.9 per cent. and next Flushing with 8.9 per cent. The United States Consular Reports for 1898 report an improvement in the condition of the Dutch merchant marine during the year 1897. The steamship companies have strengthened their fleets and added new and larger vessels and the number of general freight steamers also increased. In May 1898, a new steamship service was opened between New York, Philadelphia and Rotterdam.

Religion and Education.—Religious worship is free but the royal family and the majority of the population belong to the Reformed Church, at the head of which is a synod which holds yearly meetings at The Hague. There are four universities, viz.: the Universities of Leyden, Utrecht, Groningen and Amsterdam. At the head of the school system are three inspectors under whom are school officers and local school committees. The number of illiterates is not large. In 1896, 4.7 per cent. of the conscripts could neither read nor write.

Army and Navy.—The army consists of a regular force and a militia which is divided into an active militia and a rest militia. There is compulsory military service from the age of nineteen years but though nominally the term of service is five years, the levies serve only for twelve months continuously and after that for only six weeks of each of the succeeding four years. Besides this militia there is a *Land-storm* which consists of all who are able to bear arms. In 1897 the regular army on a peace footing was 26,972 men and 1,882 officers. In 1897 the Dutch navy consisted of 25 coast defense ships, 13 cruisers of the second and third class, 50 gun vessels of various types and 37 torpedo craft.

Revenue and Expenditure.—The budget estimates of expenditure for the year 1898 were 141,743,746 guilders and of revenue 134,432,350 guilders. A large share of the revenue was derived from the excise. Next in importance are the direct taxes on land, personal property, capital and income. There is a separate budget for the East Indian colonies, and in 1898 the total revenue of the East Indies was calculated at 135,304,203 guilders and the expenditure at 146,150,164 guilders. In 1898 the total debt was placed at 1,106,541,893 guilders of which the greater part was funded at 2½ per cent. and 3 per cent. interest. The Netherlands though nominally having a double standard are in reality on a gold basis. The money unit is the guilder or florin which is worth 40.2 cents in United States currency. For some details of the money system of the Netherlands see the article MONEY.

Colonies.—The colonial possessions of the Netherlands comprise an area of 738,000 sq. m. with a population estimated at 35,000,000. They include islands in both the East and West Indies. In the former the most important colonies are Java, Sumatra, Borneo, Celebes, Papua or New Guinea, Moluccas or Spice Islands, Timor Archipelago; in the West Indies, Surinam or Dutch Guiana, Curaçoa and its



By courtesy of *McClure's Magazine*.

AMSTERDAM HARBOR THE Y RIVER.
From this spot Henry Hudson sailed for America.

dependencies. The colonies of the Netherlands are divided into those which are directly under the home government, those which are vassal or tributary and those which are confederated. In the East Indies the Dutch possessions are divided into residencies and these in turn are subdivided. The most important of the Dutch East Indies is Java, some account of which is given under that title. At the head of the administration in Dutch East India is the Governor General. In general the Dutch have tried to govern the natives by peaceful means but lately they have encountered serious opposition from the savage inhabitants of Acheen in the northern part of the island of Sumatra (q. v.).

Political Parties.—Broadly speaking the political parties of the Netherlands may be divided into Liberals and Anti-Liberals or Conservatives, the chief apparent point of difference being a conviction on the part of the latter that the government of the nation should recognize the supremacy of the religious authority while the former hold that political and religious questions should be kept wholly distinct. The Liberal party has lately divided into several groups, viz.: the Conservative Liberals, Advanced Liberals, the Radicals and the Social Democrats. The election which was held in June 1897 returned 52 Liberals, 45 Anti-Liberals and 3 Social Democrats, or classifying the returns according to party groups there were 48 Liberals, 20 Catholics, 21 Orthodox Protestants, 4 Historic Christians, 4 Radicals, and 3 Social Democrats.

Events of the Year 1898.—An important measure was introduced in the States-General for the establishment of obligatory personal military service with exemption for ministers of all religious denominations. It became a law on June 4, 1898. The most conspicuous event of the year was the enthronement of Queen Wilhelmina who celebrated her eighteenth birthday on August 31. She assumed the government and her mother's regency ceased. Imposing ceremonies were held and on September 5 the Queen made a formal entry into Amsterdam and the enthronement was solemnized in the New Church on September 6. Then followed the formal entry into The Hague and the opening of the States-General on September 20. See the article WILHELMINA.

NEUROLOGICAL ASSOCIATION, AMERICAN, organized in New York City, June 2, 1895. Active membership limited to 100: meets annually. President, M. Allen Starr, M. D., New York City; Secretary, G. M. Hammond, M. D., 58 West 45th street, New York City.

NEVADA, a State of the Pacific slope, has an area of 110,700 sq. m. Capital, Carson City.

Geology and Mineralogy.—In company with Colorado, Nevada has made a complete change from a silver to a gold State. The production of these metals in the calendar year 1897 was: gold, 143,983 fine ounces, valued at \$2,976,400; silver, 1,228,900 fine ounces, coining value, \$1,588,881; showing an increase in a year in the output of gold of 24,579 fine ounces and a decrease in silver of 180,200 fine ounces. By values the increase in gold was equal to \$508,100, and the decrease in silver to \$232,986. The estimated production of gold in 1898, according to the director of the mint, was \$2,959,731. In 1898, 24 out of 32 Comstock companies united in a scheme to pump out all the water in the workings below the level of the Sutro tunnel, to enable them to thoroughly prospect each level, as much good ore is believed to be still obtainable. Copper, lead, coal and iron ore mining and granite quarrying have declined notably. The nickel mines in Cottonwood Cañon resumed operations in 1897, with an electric process to reduce the ore; and the same year important onyx deposits were discovered on the Brumean, north of Seko; a turquoise mine was opened up at the base of Sugar Loaf Peak, in Lincoln county; and a practically inexhaustible supply of silica, covering several hundreds of acres, was discovered in Esmeralda county.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: wheat, 1,064,271 bushels, value, \$1,011,057; potatoes, 211,110, \$189,999; and hay, 405,395 tons, \$2,837,765—total value, \$4,038,821. Live-stock comprised: horses, 44,305; mules, 1,394; milch cows, 18,069; other cattle, 224,317; sheep, 576,994; and swine, 10,441—total head, 875,520.

Railroads.—On Jan. 1, 1898, the length of all railroads in the State was about 910 miles. There has been no new construction of importance in several years.

Banks.—On Oct. 31, 1898, the State had one national bank in operation and two in liquidation. The active capital was \$82,000; circulation, \$21,692; deposits, \$345,410; reserve, \$81,716. The State banks June 30, 1898, numbered 4, and had capital, \$370,000; deposits, \$1,074,865; resources, \$1,600,047.

Education.—The superintendent of public instruction reports that the laws governing public schools are defective, unintelligible and weak. "Many of our laws are unconstitutional, others are obsolete, and there is hardly one in the statute book that can be enforced." The results of this condition are seen in the report for the school year 1896-97. The number of persons of school age in the State fell to 9,112; the

enrollment to 6,860; the attendance to 4,145. There were 228 public school buildings; 304 teachers; public school property valued at \$461,665; securities in the State school fund aggregating \$1,429,969; and expenditures, \$202,046, including \$167,171 for teachers' salaries. For higher education there were 6 public high schools and a State University, with an agricultural and mechanical department, which received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 28 periodicals, of which 8 were dailies and 47 weeklies.

Finances.—For 1897 the assessed valuations were: real estate, \$16,639,662; personal, \$6,408,534; net proceeds of mines, \$449,050—total, \$23,497,248; tax rate, \$9.20 per \$1,000. The treasury receipts during the year were \$450,127; disbursements, \$465,635; net cash in treasury at end of year, \$254,308. Excluding an irredeemable school bond for \$380,000, the total bonded debt Jan. 1, 1898, was \$292,274. All the bonds are held in educational funds.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 45,000, a steady decline attributed to reduced silver mining.

Elections and Officers.—In 1898 Nevada was entirely in the hands of the Silver Party, who elected their Governor, Reinhold Sadler, with a plurality of but 22 votes, and the Silverites controlled the legislature. Their vote for a Representative to Congress was for Francis G. Newlands, a Silverite, from Reno, who obtained 5,796 votes, while Thomas Wrenn, Populist, received but 3,111. Senators: John P. Jones, from Gold Hill, and a Silverite. Officials: Reinhold Sadler, Governor; J. R. Judge, Lieut.-Governor; Eugene Howell, Secretary; D. M. Ryan, Treasurer; S. P. Davis, Comptroller; O. Ring, Superintendent of Public Instruction; C. H. Galusha, Adjutant-General; W. D. Jones, Attorney-General. All are Silverites except Ring and Galusha (Rep.); Chief-Justice, M. S. Bonnifield; Associates, W. A. Massey and C. H. Belknap, and Clerk, Eugene Howell, all Silverites. The State legislature consists of 1 Democrat, 14 Republicans, 26 Silverites, and 4 Independents.

NEWBOLT, HENRY JOHN, poet, born in Bilston, England, June 6, 1862. He is the son of the late Rev. Henry Francis Newbolt, vicar of St. Mary's, Bilston; was educated at Oxford, where he took prizes; and was called to the bar of Lincoln's Inn in 1887. His books are: *Taken from the Enemy* (1892); *Modred*, a tragedy (1895); *Admirals All* (1897), which had an extraordinary sale; and *The Island Race* (1898).

NEW BRUNSWICK, a province of the Dominion of Canada, has an area of 27,322 sq. m. Capital, Fredericton.

Industries.—The principal industries of the province are those connected with the fisheries, which in 1896 yielded products valued at \$4,799,433, chiefly herring, \$1,518,288; salmon, \$529,428; cod, \$490,536; lobsters, \$436,303; and smelts, \$415,503. Apparatus of all kinds employed in the industry had a value of \$1,878,459, and exports of fishery products (1897), \$757,207. The development of agricultural and mineralogical interests is still very backward. In 1896, coal yielded 7,500 short tons, and gypsum 67,137 tons, value, \$59,024. No coal production was reported for 1897, and 60,523 tons were imported for home consumption. There was a slightly increased activity in the petroleum industry; but no serious attempt was made to work the large deposits of hematite iron ore that exist near Woodstock.

Commerce.—The imports of merchandise in the year ending June 30, 1897, amounted in value to \$4,819,418; duties collected, \$967,793; exports, \$9,584,982. There were 923 registered vessels of all kinds in the mercantile marine, of 103,584 tons. Navigation was facilitated by 93 light houses, 3 fog alarms and one lightship, with a total of 122 lights.

Banks.—On June 30, 1897, there were 42 post-office savings banks, with 5,789 depositors and \$1,922,299 deposits, and 6 government savings banks, with 17,151 depositors and \$6,666,024 deposits. In the year then ended the exchanges at the clearing house at St. John aggregated \$30,383,000.

Railways.—The railways, June 30, 1897, had a total length of 1,453 miles, and their construction had been aided by an aggregate of \$4,857,091 in bonuses and subscriptions.

Education.—Public schools numbered 1,737, June 30, 1897, with 1,829 teachers, 61,908 enrolled pupils, and 37,154 pupils in average daily attendance. The receipts were \$497,419; expenditures, \$473,994; of total receipts, \$208,027 was from district assessments, \$198,483 from government grant, and \$90,909 from municipal appropriations. There were 15 public libraries, with 54,787 volumes, and 46 periodicals of all kinds.

Finances.—In the year ending Dec. 31, 1897, the revenue was \$745,203; expenditure, \$727,187. The gross debt on that date was \$3,053,957; assets, \$565,329; net debt, \$2,488,578. The government subsidy to the province was \$483,556.

Population.—In 1897 there was an Indian population of 1,658, who cultivated 1,340 acres of land, and received \$16,185 for their various industries. Six schools were

maintained for Indian youth. Local estimates gave St. John a population of 40,179; Moncton, 10,000; Campbellton, 3,000.

NEW ENGLAND ORDER OF PROTECTION, a fraternal society founded in 1887, has 6 grand lodges, 267 sub-lodges, and 21,950 members. Since its organization, \$1,597,000 has been disbursed and \$297,000 during its last fiscal year. Supreme Warden, Lucius P. Deming, New Haven; Supreme Secretary, D. M. Frye, Boston.

NEW ENGLAND SOCIETY, founded in 1805, incorporated 1833, has 1,471 members. Its objects are to commemorate the landing of the Pilgrim Fathers on Plymouth Rock, to promote friendship, charity, and mutual assistance, and to engage in literary exercises, relating to the history of New England. The annual festival and banquet is held on Dec. 22. Henry E. Howland, President; George Wilson, Secretary.

NEWFOUNDLAND, an island and British colony of North America, with an area of 42,000 sq. m. Capital, St. Johns.

Industries.—The principal industries of the colony are those connected with the various fisheries; but the completion in 1898 of the great railway between St. Johns and Port-au-Basque, on the west shore, will lead to the early development of great possibilities in lumbering, agriculture, quarrying and the mining of coal, iron, copper and other minerals, that have only been waiting for direct communication with the large cities. This railway ends the insular isolation of what is pronounced to be the richest part of the colony. The cod fishery continues to be the most important one, and after it come the seal and lobster, the latter being of recent origin and yielding annually from 60,000 to 65,000 cases of 48 pounds each.

Commerce.—In 1898 the imports of merchandise, largely food and clothing, aggregated about \$8,000,000 in value, and the exports, chiefly dried fish, lobsters, cod oil, seal oil, seal skins, minerals and lumber, about \$9,000,000. The trade with Canada alone (1897) was, imports, \$1,692,798; exports, \$452,906. Registered shipping aggregated nearly 2,500 vessels of over 105,000 tons, nearly all sailing craft.

Railways.—In June 1898, the great transinsular railway was completed between St. Johns and Port-au-Basque at the southwestern extremity of the island, a distance of nearly 600 miles. Starting from St. Johns it extends around the principal bays on the east to the north, thence south and across the island to the southwestern terminus. A branch line extends to Harbor Grace, 83 miles, and another to Placentia, 84 miles. A third branch, to Brigus, 55 miles, was under construction at the close of the year. The main line cost about \$13,000,000. Express trains, with the latest style of sleeping and dining cars, are now running across the island three times a week each way, and soon will be making daily trips.

Government.—In 1898 the public affairs of the colony were administered by a Governor and Executive Council of 7 members, a Legislative Council of 14 members, and a Legislative Assembly of 36 representatives. The judicial department comprised a Supreme Court, with a Chief Justice and two Associate Justices; a Vice-Admiralty Court, and District and Circuit Courts. In 1898, Sir Henry McCallum, Lieutenant-Colonel in the Royal Engineers, was appointed Governor of the colony. Both Great Britain and France determined to replace with better and faster vessels the warships they have been maintaining off the coast for the protection of their respective fishery interests. The appointment of the engineer who constructed the Singapore fortifications to the Governorship of the colony was locally considered a confirmation of the report that the British War Office had ordered extensive fortifications at St. Johns. Newfoundland sought and was granted representation on the Joint High Commission to negotiate a plan of settlement of all subjects of controversy between Canada and the United States. At the close of the year it was believed in St. Johns that if the Canadian Commissioners failed to secure a fishery arrangement with the United States the British government would permit Newfoundland to negotiate an independent treaty on the basis of the Bond-Blaine convention. This provided for the free entry into the American markets of Newfoundland fish, in return for which American vessels were to receive free bait and fishing privileges in Newfoundland.

Churches and Schools.—Numerically the Church of England is the strongest denomination, and following it, the Church of Rome, the Wesleyan, and the Presbyterian. Both the English and Roman churches have cathedrals in St. Johns. The system of education is based on the denominational principle, the grant from the general revenue for educational purposes being appropriated directly to the schools of the different denominations. In 1898 periodicals of all kinds numbered 8.

Population.—In 1898 the population of the island was about 200,000; St. Johns, 25,000; Trinity, 17,000; Harbor Grace, 6,500; Twillingate, 3,000.

The French Shore Question.—In 1898 the British Colonial Office appointed a commission to visit the colony, investigate its condition, and report recommendations for its betterment. The commission paid special attention to the long-standing grievances concerning the French shore fishery rights, and in its report warmly espoused the view of the colonial authorities. On considering the report the colonial office

took a keener interest in the welfare of the colony than ever before, and on the main cause of controversy undertook an arrangement with France for the extinction by purchase of all French claims in Newfoundland. Near the close of the year the people of Normandy and Brittany, who have been engaged in the North American fisheries since their discovery, protested against any settlement which did not compensate them for the loss of their trade. The trade, it was claimed in Newfoundland, had so dwindled in late years that a very small sum would pay for all actual loss by extinguishment.

The treaty shore extends along the entire western coast from Cape Ray at the south around the apex and southward to about the middle point on the eastern coast. According to the treaty of Utrecht the French claimed fishing privileges within a certain area. The treaty of Paris in 1763 ceded to France the islands of St. Pierre and Miquelon and made it possible to establish a system of bounties on cod fishing. The treaty of Versailles in 1783 contains an obscurely worded declaration in regard to the shore. The French have contended that their privileges in that region are exclusive and that the native-born may be barred from the territory. The English have combated this and held that the native Newfoundlanders could not be excluded. The privileges accorded to the foreign fishermen conflict with what appear to be the rights of the settlers. During the fishing season the former are guarded against competition. The French, moreover, have opposed the establishment of railway termini on the shore as well as mining and lumbering within the region as contrary to their treaty rights, and as a consequence business enterprise in those directions has been forbidden by the British government. It is said that, although 8,000 or 10,000 fishermen leave the French ports for the banks each year, very few of them fish on the treaty shore and it is complained that to protect these slight fishing interests of the French, 12,000 settlers are barred out from the means of earning a livelihood.

Events of 1898.—An important railway contract was made by the government with Mr. Robert G. Reid on March 15, 1898. The latter agreed to work the Newfoundland railway at his own expense, maintaining it in a safe, efficient and satisfactory manner during a period of fifty years, at the end of which time it should become his property upon the payment of a specified sum. The terms of the contract are too lengthy for discussion here, but the general result was to give Mr. Reid control of property which cost the government upwards of \$12,700,000, comprising besides all the railways in Newfoundland, the St. Johns dry dock and the telegraph lines. In 1898 the total length of the Newfoundland railway lines was 775 miles. It was reported that although the budget statement which was made on March 11 showed a deficit, the revenue would balance the expenditure for the ensuing year. The attempt was made to induce the home government to appoint a commission to inquire into the financial affairs of the colony, its economic conditions and the question of the French shore. The imperial government refused this request, but upon further solicitation appointed royal commissioners to investigate the French treaty shore.

NEW GUINEA, or **PAPUA**, is, with the exception of Australia, the largest island in the world, having an area of 313,000 sq. m. It lies to the north of Australia and comprises British New Guinea, Kaiser Wilhelm's Land and Dutch New Guinea. British New Guinea occupies the southeastern part of the island with an area of 88,460 sq. m. and a population of about 350,000. The Dutch territory bounds it on the west and the German on the north. It is under the administration of a Lieutenant-Governor (Sir William Macgregor in 1898). The three Australian colonies of Queensland, New South Wales and Victoria contribute to the cost of administering the colony and have a voice in the government. The seat of government is at Port Moresby, where there is a central court. The colony is not yet self-supporting, and in 1898 the guarantee on the part of the Australian colonies was continued for four years with the expectation that at the end of that time the colony would be able to maintain its administration out of its own resources. There are few Europeans in the island, but excellent work has been done in the maintenance of order and the training of the inhabitants in the arts of civilization. Much credit is due to the missionaries for this work of improvement. There is said to be an abundance of good timber, and valuable forest products on the island. The chief exports are trepang, pearl shell, copra, gold, sandal-wood and pearls. Kaiser Wilhelm's Land has been a German protectorate since the year 1884 and its administration is in the hands of the German New Guinea company. Its area is estimated at about 70,000 sq. m. and its population at about 110,000, including in 1896 a European population (with the Bismarck Archipelago) of 164, the majority being Germans. The chief products are areca and cabinet woods and tobacco is successfully cultivated. Live-stock is raised on the island and gold has recently been discovered. Dutch New Guinea has an area of 151,789 sq. m. with a population roughly estimated at 200,000. It is part of the Dutch colonial possessions in the East Indies and is administered by a Resident, whose seat of government is at Ternate.

NEW HAMPSHIRE, a New England State, has an area of 9,305 sq. m. Capital, Concord.

Mineralogy.—The most important mineral production of the State during 1897 was granite, which had a value of \$641,691, the highest in four years. In the period 1890-97, the production fluctuated in value from \$750,000 to \$442,424. Clay products were second, 53 plants having an output worth \$464,672, principally brick and tile. There was a small output of copper and mica, but none worth reporting of gold, silver or soapstone.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 976,743 bushels, value, \$449,302; wheat, 9,804, \$9,020; oats, 1,007,754, \$382,947; barley, 115,502, \$66,991; rye, 17,028, \$12,771; buckwheat, 59,520, \$27,974; potatoes, 1,696,500, \$831,285; and hay, 767,981 tons, \$7,103,824—total value, \$8,884,114. Live-stock comprised: horses, 55,028; milch cows, 136,825; other cattle, 79,380; sheep, 78,289; and swine, 56,104—total head, 405,626.

Manufactures.—The report of the Bureau of Statistics of Labor for the two years ending in 1896 showed 64 establishments engaged in the manufacture of shoes, which employed 8,069 persons, paid in wages, \$3,469,918, and had an annual output worth \$11,986,008. In 1898 the cotton mills had a total of 1,308,463 spindles in operation, an increase of 109,820 since 1890, giving the State third rank in number of spindles, with South Carolina a close fourth.

Commerce.—During the fiscal year ending June 30, 1898, the foreign trade in merchandise at the port of Portsmouth declined to imports valued at \$17,275, a decrease in a year of \$7,457. There were no exports.

Railroads.—On Jan. 1, 1898, the length of all railroads in the State was 1,173.54 miles, of which less than a mile was constructed in the previous year. Including secondary tracks, the mileage was about 1,215. The assessed valuation of all railroad property in 1897 was \$21,855,000.

Banks and Insurance.—On Oct. 31, 1898, there were 52 national banks in operation and 10 in liquidation. The active capital aggregated \$5,880,000; circulation, \$3,810,830; deposits, \$11,762,745; reserve, \$3,734,106. The mutual savings banks, June 30, 1898, numbered 51, and had depositors, 122,590; deposits, \$48,155,076; resources, \$54,759,036; and surplus and profits, \$4,009,943. In 1897 there were 33 building and loan associations, with 42,817 shares outstanding, \$2,304,802 on loans, and \$2,469,884 in assets. The State Insurance Commissioner, reporting in 1898 on the business of 1897, showed that the amount of risks written in the year was \$83,082,339; premiums received, \$1,102,839; losses incurred, \$510,989. The share of all companies chartered by the State was: risks, \$38,654,557; premiums, \$496,812; losses, \$211,303.

Finances.—The treasury receipts in the year ending May 31, 1898, were \$1,325,687; expenditures, \$1,152,468; balance, June 1, \$414,516. The total funded debt, June 1, 1898, was \$1,436,800; trust funds, \$699,843; floating debt, \$100—total debt, \$2,136,743; assets, \$769,085; net debt, \$1,367,658. For 1897 the assessed valuations aggregated \$255,742,099.

Education.—At the end of the school-year 1896-97, there were 66,139 persons of school age in the State, of whom 64,207 were enrolled in the public schools, and 47,717 were in daily attendance. There were 1,917 public school houses; 2,711 teachers; public school property valued at \$3,284,121; and expenditures, \$1,040,309, including \$651,647 for teachers' salaries. For higher education there were 52 public high schools; 28 private secondary schools; a public normal school; one college (Dartmouth), with 34 professors and instructors, 469 students, and \$88,000 income; a Methodist college for women, with 12 instructors, 180 students and \$20,000 income; a State college of agriculture and mechanic arts, and one medical school. The State received from the federal government for its agricultural college \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 103 periodicals, of which 14 were dailies, 73 weeklies and 12 monthlies.

Population.—As estimated by federal officials, the population on June 30, 1898, was about 390,000. A local estimate gave Manchester 56,000.

Politics and Elections.—The Democratic convention in 1898 reaffirmed the principles of the party since its foundation and denounced the Republicans for passing the Dingley tariff bill, "a measure calculated only to protect monopolies, insufficient to raise the necessary revenue to meet the ordinary expenses of the government, and based on no principle of equity or justice." It also renewed its adhesion to the Monroe doctrine, asserting that "our national sphere of influence comprehends and embraces the entire Western Hemisphere." It declared against acquisition of territory in other parts of the world "beyond securing requisite coaling and naval stations for the convenience and protection of our commerce."

The Republican convention reaffirmed the St. Louis platform, especially indorsing the gold standard as therein provided. It declared that the war with Spain "has brought about a better understanding between the two great English-speaking nations of the globe, whose united action will contribute to the maintenance in the twentieth century of a universal peace among civilized nations." The platform re-

affirmed the Monroe doctrine, while favoring "such disposition of the Philippines as will best promote the growing commercial and political interests of the United States, extinguish the sovereignty of Spain, and make good our obligations to the people of those islands."

In the Congressional and State elections, charges brought against Senator Gallinger and other members of the Republican State Committee by a dissatisfied faction of the Republican party helped the Democrats to some extent. The Republican candidate for Governor, Frank W. Rollins, was elected by a plurality of 9,077, which was smaller by 7,500 than the plurality of 1896. The Republicans also elected their Representatives in Congress, and in the State legislature they gained a majority on joint ballot of 120.

National Representatives and State Officers.—New Hampshire's Representatives are: Cyrus A. Sulloway (Rep.), from Manchester, and Frank G. Clarke (Rep.), from Petersboro. Senators: William E. Chandler (Rep.), from Concord, and Jacob H. Gallinger (Rep.), from Concord. Officials: Frank W. Rollins, Governor; Ezra S. Stearns, Secretary; Solon A. Carter, Treasurer; A. D. Ayling, Adjutant-General, and Edwin J. Eastman, Attorney-General. All are Republicans. Chief Justice, Isaac N. Blodgett (Dem.); Associates, William M. Chase (Dem.), Frank N. Parsons (Rep.), Robert G. Pike (Rep.), R. M. Wallace (Rep.), Robert J. Peaslee (Dem.), and John E. Young (Rep.). Clerk, A. J. Shurtleff (Rep.). There are 271 Republicans and 151 Democrats in the State legislature.

NEW JERSEY, a Middle Atlantic State of the United States, has an area of 7,815 sq. m. Capital, Trenton.

Mineralogy.—In the summer of 1897 the first discovery of white mica in the State was made in Passaic county near Bloomingdale. Specimens were pronounced by experts to be equal to the standard commercial white mica of Canada, worth at that time about \$2,500 per ton. The new field, while extending over 20 acres, is at present of unknown quantity; but it is undergoing development. During 1897 the clay industry (see paragraph Manufactures) yielded \$5,322,497; iron mining yielded 254,235 long tons of magnetite ore, worth \$491,838, a decline of over 10,000 tons; quarrying produced \$895,179, an increase of \$357,459 in a year, principally in granite, used for road-making (\$561,782), sandstone (\$190,976), and limestone (\$141,646); and the entire output of zinc was exported to Germany and Belgium, where it is used for special requirements.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 9,334,841 bushels, value, \$3,733,936; wheat, 2,168,318, \$1,582,872; oats, 1,923,485, \$596,280; rye, 1,066,121, \$533,060; buckwheat, 223,335, \$120,601; potatoes, 3,491,850, \$2,130,028; and hay, 574,136 tons, \$5,511,706—total value, \$14,208,493. Live-stock comprised, horses, 79,180; mules, 7,269; milch cows, 214,674; other cattle, 41,558; sheep, 42,299; and swine, 151,120—total head, 536,100.

Manufactures.—In 1897 there were 150 clay-working plants, which produced brick and tile to the value of \$4,195,134, and pottery, \$1,127,363. The State ranked first in the manufacture of fancy and enameled brick and of ornamental terra-cotta work. The brick and terra-cotta industry employed a capital of \$2,058,540; the hat, \$694,740; the shoe, \$393,546; silk goods, \$9,330,440; and woolen and worsted goods, \$4,246,373. The various taxable manufactures yielded the federal government \$4,719,981 in internal revenue in the year ending June 30, 1898. The tobacco industry had an output of 62,910,358 cigars, 302,650 cigarettes, 8,621,257 pounds of plug, 2,415,688 pounds of fine cut, 6,493,776 pounds of smoking, and 4,954,409 pounds of snuff. There were 55 distilleries of all kinds in operation, and a production of 454,981 gallons of spirits. Of fermented liquors there was an output of 2,109,791 barrels.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise at the ports of Bridgeton, Newark, and Perth Amboy aggregated in value \$866,269; exports from the two last, \$1,976,912; increase in imports in a year, \$534,810; in exports, \$388,552. The gold and silver movement was, imports, \$1,066,620; exports, nothing; making the total foreign trade of the year at these ports, \$3,909,801. It should be borne in mind that the large foreign trade at the port of Jersey City is credited to the port of New York.

Communications.—On Jan. 1, 1898, the length of all main railroads in the State was 2,229.98 miles, of which 12.92 miles were constructed in the previous year. Secondary trackage brought the total up to about 5,000 miles. The aggregate assessed valuation of railroad and canal property for 1898 was \$236,464,356, and the tax levied thereon was \$1,586,110. Of the total tax levied, \$1,182,321 was for State purposes, and \$403,788 for local uses. The number of roads built in 1898 under the State aid law was eighty-five, nearly all of which were of stone. This brings up to 325 the mileage of permanent roads constructed since the State began contributing towards the cost of road-building, and does not include the roads built by counties and townships without State aid. The total cost of roads constructed under the law since its passage in 1893 is \$565,826.

Banks.—On Oct. 31, 1898, there were 105 national banks in operation and 14 in

liquidation. The active capital aggregated \$14,534,547; circulation, \$5,507,852; deposits, \$62,416,084; reserve, \$17,611,711. The State banks, June 30, 1898, numbered 21, and had capital, \$1,736,850; deposits, \$7,448,802; resources, \$11,058,650; loan and trust companies, 23, with capital, \$2,700,000; deposits, \$23,290,366; resources, \$29,324,930; and mutual savings banks, 26, with depositors, 170,100; deposits, \$46,596,668; resources, \$51,345,043; surplus, \$4,643,870. There were also 305 local and 20 national and State building and loan associations, with 123,204 shareholders, and gross assets, \$49,674,478.

Education.—The par value of the securities in the State school fund in 1898 was \$3,585,054; the market value considerably higher. Public school tax receipts and expenditures were each \$2,194,844. At the end of the school-year 1896-7, there were 456,862 persons of school age in the State, of whom 294,880 were enrolled in the public schools, and 191,776 were in daily attendance. There were 1,766 public school buildings; 5,869 teachers; public school property valued at \$12,605,882; and expenditures, \$5,277,247, including \$3,194,049 for teachers' salaries. For higher instruction there were 76 public high schools; 69 private secondary schools; 3 public normal schools; 4 colleges and universities, co-educational and for men only, with 143 professors and instructors, 1,540 students, and \$510,394 income; 2 colleges for women, with 41 instructors, 55 students, and \$16,560 income; 2 technical schools, with 40 instructors, 657 students, and \$74,920 income; and 5 theological schools. The Rutgers Scientific school, endowed by Congress, received from the federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 391 periodicals, of which 50 were dailies, 285 weeklies, and 45 monthlies.

Charitable Institutions.—In January 1898, the legislature provided for the establishment of a State village for epileptics, and subsequently the Maplewood farm of 187 acres near Princeton was selected for the new charity and an option obtained on an adjoining farm of 213 acres. During the year the State made the following payments for charitable institutions and purposes: State insane hospitals, \$212,048.25; county insane asylums, \$158,626.43; Soldiers' Home, \$27,997.85; Reform School for Boys, \$61,902.10; Industrial School for Girls, \$21,000; for the care of the feeble-minded, \$66,330.21; factory inspection, \$10,091.70; care of the blind, \$10,609.90; pensions, \$3,700; and State Charities Aid, \$600—total, \$572,906.44.

Finances.—In the year ending Oct. 31, 1898, the receipts of the State fund were \$2,723,755, which, with balance from previous year, made the available amount, \$3,669,101. The disbursements were \$2,667,577, leaving a balance of \$1,001,524, the largest the State has ever had. On Jan. 1, 1899, the State paid an installment (\$123,000) of the old war debt, which left \$71,000 due in 1902. This, with agricultural college certificates (\$48,000), made the total debt, Jan. 1, 1899, \$119,000, against which the State held securities aggregating \$783,699.

Population.—The State census of 1895 gave the State a population of 1,673,106, and Newark, 215,806; Jersey City, 182,713; Paterson, 97,344; Camden, 63,467; Trenton, 62,518; and Hoboken, 54,083. Estimates in 1898 gave the State 1,820,000; Newark, 250,000; Jersey City, 200,000; Camden, 65,000; Hoboken, 60,000; and Elizabeth, 50,000.

Legislation, etc.—The Governor was elected with a Republican plurality of 5,499 votes, and the Republicans control the State legislature. Besides revising certain existing laws, the legislature passed an act to define the title of the person who shall act as governor in case of the death, resignation, etc., of the incumbent. The title shall be "President of the Senate (or Speaker of the House of Assembly), Acting Governor of the State of New Jersey." Another act, to take the place of legislation declared unconstitutional on account of discrimination, provided for the registration of labels, trade-marks, terms and designs.

Another act dealt with railroad grade-crossings. Gates may be ordered by the town or railroad company at the request of either and the expense shared between them. Laws were passed for protection against insect pests and the "San José scale" in particular, and providing for the destruction, if necessary, of infested nursery stock. A State entomologist was also provided for. The State election laws were revised and the use of an official envelope for the ballot was authorized; and the vote of an absent soldier in time of war was permitted to be sent home in a sealed envelope to a proxy, to be deposited by him. The libel laws were modified. "Any person who wilfully states or transmits to a newspaper or magazine any libellous statement, untrue in fact, and thereby secures its publication is to be punished by fine or imprisonment; and in any civil action for libel against the owner, editor, etc., of any paper, magazine, etc., the defendant may give proof of intention, and unless the plaintiff shall prove either malice in fact, or the defendant, after having been requested by him in writing to retract the libellous charge in as public a manner as that in which it was made, fails to do so within a reasonable time, he shall recover only his actual damage proved and specially alleged in the declaration."

The movement in the direction of library extension through the establishment of State travelling libraries, first undertaken by the New York State Library in 1892,

has since spread to Montana, Michigan, Ohio, and Iowa, and during the past year to New Jersey.

A law prohibiting the use of the trading stamp passed the legislature, but was vetoed by the Governor. An act provided that the commitment of the insane on the certificate of physicians shall be only for 15 days unless within that period there is an application to a judge who is authorized to try the question of sanity, *vel non*, with or without a jury; and another providing for a like investigation on a writ of habeas corpus sued out by or on behalf of an insane person.

National Representatives and State Officers.—New Jersey's Representatives are: H. C. Loudenslager (Rep.), from Paulsboro; John J. Gardner (Rep.), from Atlantic City; Benjamin F. Howell (Rep.), from New Brunswick; J. S. Solomon, Jr., (Dem.), from Boonton; James F. Stewart (Rep.), from Paterson; R. Wayne Parker (Rep.), from Newark; William D. Daly (Dem.), from Hoboken; and Charles N. Fowler (Rep.), from Elizabeth. Senators: William J. Sewell (Rep.), from Camden, and a Republican. Officials: Foster M. Voorhees, Governor; George Wurtz, Secretary; G. B. Swain, Treasurer; W. S. Hancock, Comptroller; Samuel H. Grey, Attorney-General; W. S. Striker, Adjutant-General; C. J. Baxter, Superintendent of Education; and William Bettie, Commissioner of Banking and Insurance. All are Republicans. Chief Justice, W. J. Magie, (Rep.); Associates, D. A. Dupue (Rep.), T. Dixon (Rep.), B. Vansyckel (Dem.), C. G. Garrison (Dem.), J. H. Lippincott (Dem.), W. S. Gummere (Rep.), G. C. Ludlow (Dem.), and Gilbert Collins (Rep.); and Clerk, William Riker. The State legislature is composed of 51 Republicans and 30 Democrats.

NEW JERUSALEM CHURCH. See SWEDENBORGIANS.

NEW MEXICO, a southwestern Territory of the United States, has an area of 122,580 sq. m. Capital, Santa Fé.

Mineralogy.—During the calendar year 1897 there was a decline in the output of both gold and silver as compared with the previous year, the production of gold being 17,246, fine ounces, valued at \$356,500, and that of silver, 539,500 fine ounces, coining value, \$697,535, the aggregate being \$311,042 less than in 1896. For 1898 the gold output was estimated at \$360,000, an increase. The coal product of 1897 was 716,981 short tons, spot value, \$991,611; the largest amount on record excepting in 1895. There were 15 mines in operation, and the largest output was in Bernalillo county. Copper mining was carried on principally near Fort Bayard; output, 701,892 pounds, a decline of about 2,000,000 pounds from that of 1896, the largest on record. The output of coal in the fiscal year 1897-8 was reported at 858,583, estimated value, \$1,408,680.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 509,418 bushels, value \$285,274; wheat, 4,586,926, \$2,843,894; oats, 271,522, \$111,324; barley, 37,856, \$20,821; potatoes, 42,572, \$33,206; and hay, 148,106, \$1,088,579—total value, \$4,383,098. Live-stock comprised, horses, 83,351; mules, 3,472; milch cows, 19,317; other cattle, 701,967; sheep, 3,128,692; and swine, 30,204—total head, 3,967,000. The Territory ranked second in the number of sheep. Over eleven million pounds of wool are raised annually and although this territory has as good water power as any in the country and an inexhaustible supply of coal, yet the wool is chiefly shipped abroad, as are also the hides of the immense herds on the plains. Excluding cultivated land, mountainous districts inaccessible to flocks, and land grants, there are 55,000,000 acres in New Mexico peculiarly adapted to sheep pasturage. The industry is owned entirely by permanent residents, and it supports a larger proportion of the people than any other except agriculture. Nearly 3,000 men having families are constantly employed in tending the flocks, which thus support more than 15,000 persons.

Manufactures.—Notwithstanding her vast stores of natural treasures and raw materials, New Mexico as yet has developed few manufacturing industries. The rapid growth of the sheep and wool industry, however, has resulted in the establishment of another home enterprise, that of wool pulling and tanning. There are at Las Vegas two wool pulling plants, one of which is also engaged in tanning leather. The beet sugar industry in the Pesos valley has incited widespread interest in the cultivation of sugar beets.

Transportation.—In 1898 the railroads comprised the Atchison, Topeka, and Santa Fé, the Denver and Rio Grande, the Pesos Valley and Northeastern, the Union Pacific, Denver and Gulf, the Southern Pacific, the Alamogordo and Sacramento Mountain, the Santa Fé Pacific (formerly the Atlantic Pacific), and the Silver City, Deming, and Pacific roads. The total mileage was reported at 1,502.07.

Banks.—On Oct. 31, 1898, there were 6 national banks in operation and 9 in liquidation. The active capital aggregated \$600,000; circulation, \$402,673; deposits, \$2,785,391; reserve, \$748,341. Territorial banks numbered 6, with capital, \$231,700; deposits, \$796,370; resources, \$1,079,893. There was also one stock savings bank, with capital, \$30,000; deposits, \$67,457; resources, \$98,326.

Education.—At the end of the school-year 1896-7 there were 48,924 persons of school age in the Territory, of whom 24,155 were enrolled in the public schools, and 19,349 were in daily attendance. There were 523 public school districts; 492 schools; 605 teachers; public school property valued (1895-6) at \$264,430; and expenditures, \$155,955, of which \$124,015 was for teachers' salaries. There were also 60 sectarian schools, with 135 teachers, 3,600 pupils, and property valued at \$313,600. For higher education there were 7 public high schools; 3 private secondary schools; a public normal school; a university; school of mines; college of agriculture and mechanic arts; and a military institute. The percentage of illiteracy in the total population in 1898 was 21. The agricultural college at Mesilla Park, endowed by Congress, received from the federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 57 periodicals, of which 5 were dailies, and 47 weeklies.

Finances.—The equalized assessed valuations for 1897 aggregated \$39,478,119; receipts of the treasury from Nov. 30, 1896, to May 28, 1898, \$540,488; expenditures in same period, \$462,876; tax rate for 1897, \$10.80 per \$1,000; bonded debt, Sept. 1, 1898, \$1,066,800, outstanding militia warrants, \$600,000.

Population.—On Oct. 1, 1898, Gov. Otero estimated the white population at 257,000, and the Indian, comprising the Pueblos, Jicarillas, Mescaleros, and Navajos, at 25,900—in all, 282,900.

Legislation.—An important bill was passed in the House of Representatives on May 25, granting 1,500,000 acres of land to the Territory of New Mexico for common school, college, and university purposes, and also for charitable institutions, public buildings, irrigation, and improvements along the Rio Grande river. This bill was intended to convey a partial grant of the lands to which the Territory would be entitled on its admission into the Union. Its passage occasioned a speech from Mr. McMillan, a Democratic Representative from Tennessee, in which he denounced the refusal of statehood to New Mexico as a political move on the part of the Republicans. The principal law of universal interest was regarding the insurance question. An act was passed on March 17, 1897, by the New Mexico Territorial legislature, providing that all insurance companies doing business in the Territory shall deposit \$10,000 in cash or in municipal or territorial bonds at par as a guarantee of the payment of losses. Senator Davis introduced a bill disapproving of the act, and the Senate committee decided to postpone indefinitely a bill to annul it.

The Governor's Report.—In his annual report to the Secretary of the Interior, Gov. Miguel A. Otero recommended the admission of New Mexico as a State. He pointed out that with the exception of Dakota, none of the Territories lately admitted have been as populous as New Mexico, and the assessed valuation is \$40,000,000, \$10,000,000 more than that of Idaho or Wyoming. The report laid special stress on the possibilities of irrigation and called attention to the fact that great numbers of windmills were being erected throughout the Territory by individual enterprise. This report also contained a letter from Col. Roosevelt, dated Santiago de Cuba, July 25, commending the behavior of the New Mexicans in the "Rough Riders" regiment.

Officers.—Representatives in Congress, Hervey B. Ferguson (Dem.), from Albuquerque; Miguel A. Otero (Rep.), Governor (he was elected with a plurality of 2,063); George H. Wallace (Rep.), Secretary; S. Eldodt (Dem.), Treasurer; M. Garcia (Dem.), Auditor; W. H. Whiteman (Rep.), Adjutant-General; E. L. Bartlett (Rep.), Solicitor-General; M. C. de Bacca (Rep.), Superintendent of Education. Chief Justice, William J. Mills; Associates, John R. McFie, J. W. Crumpacker, F. W. Parker, and C. C. Leland; and Clerk, José D. Sena. All are Republicans. The Territorial legislature has 7 Democrats and 29 Republicans.

NEW SCHOOL AND OLD SCHOOL PRESBYTERIANS. See PRESBYTERIAN CHURCH OF THE UNITED STATES (NORTH), AND PRESBYTERIAN CHURCH OF THE UNITED STATES (SOUTH).

NEW SOUTH WALES, a British colony in southeastern Australia with an area of 3,107,005 sq. m. and a population in 1898 estimated at 1,335,800. The capital is Sydney with a population estimated in 1896 of 410,000, including the suburbs. Agriculture and sheep-raising are the main occupations. The chief crops are wheat, maize, barley, oats, potatoes, hay and tobacco, and the chief fruit culture is that of oranges. There are also a large number of vineyards, the production of wine in 1897 amounting to 790,256 gallons. The great produce of the country is wool, which is the staple export, being valued in 1896 at £9,897,332. The coal-fields of New South Wales are extensive and the seams of great thickness. In 1896, 3,909,517 tons valued at £1,125,281 were taken out. The colony is rich in gold, the production of which from the time of its discovery in May 1851, down to the close of the year 1896 was valued at £43,399,958. The greater part of the commerce of New South Wales is with the United Kingdom and its colonies, the trade with the United Kingdom itself being almost equal to that with the Australian colonies and the other British possessions. In 1896 out of a total trade valued at £23,010,349, £2,064,964 was with the United States and £3,674,348 with other foreign countries, all the rest be-

ing with the United Kingdom and British colonies or other possessions. On June 30, 1897, there were 2,639 miles of government railways open for traffic. The government controls education, which is compulsory for children between the ages of 6 and 14 years. There is freedom of religious worship, all sects being on the same footing. As to the form of government, the executive authority in New South Wales is vested in a Governor, who is aided by a Cabinet of ten Ministers. In 1898 the Governor was the Rt. Hon. Viscount Hampden and the Premier was the Rt. Hon. George Houstoun Reid, who was re-elected in the general elections at the close of July 1898. The legislative authority is vested in a bicameral parliament, the upper House being known as the Legislative Council and the Lower as the Legislative Assembly. The members of the former are appointed by the crown for life and of the latter are elected by the male resident population 21 years of age or over.

Events in 1898.—The chief political question before the people of New South Wales in 1898 was the question of federation an account of which is given in the article AUSTRALIA (q. v.). The constitution drafted at the convention at Melbourne was submitted to popular vote in the colonies. As the mother colony, the decision of New South Wales was specially important. Queensland did not vote, preferring to await the action of the parent colony. Of the four colonies voting, New South Wales was the only one whose vote fell below the required minimum for the adoption of the measure. The vote was taken on June 2, 1898, and showed 75,990 for federation and 65,619 against it, the majority being 5,371. The required minimum was 80,000 and thus the vote, though it gave a majority for federation, fell below the necessary limit. The total number of the electorate in New South Wales was 293,000, so despite the importance of the question, a comparatively small number of qualified electors registered their votes. The adverse decision in New South Wales was a serious check to the federation movement. The reason for the opposition to the proposed union in this, the oldest of the colonies, is said to have been the fear that the other colonies would out-vote New South Wales, especially in tariff matters. The New South Wales Parliament was opened on June 21 and the Governor announced at that time that the administration was framing proposals for the alteration of the constitution in such a way as to meet the requirements of New South Wales. The chief points in which the instrument was to be altered were the making of a bare majority vote at the joint session of both houses of the federal legislature decisive, instead of a three-fifths majority; the recasting of some of the financial provisions; the remodeling of appellate jurisdiction; the adoption of the Canadian plan, somewhat modified, in regard to the seat of government; the withdrawal from the Senate of the right to amend money bills; and the protection of the territorial rights of the States. In the general election which was held toward the close of July, the federation question remained the chief issue. The opposition to the government charged it with insincerity in its attitude toward union and with offering amendments to the proposed constitution which it knew that the other colonies would not accept. The government, on the other hand accused the opposition of aiming at a settlement which was injurious to the interests of New South Wales. The opposition gained as a result of the elections, and three members of the cabinet were defeated but the government secured a majority. The party in power now proceeded to amend the constitution in such a way as to make it acceptable to the people of New South Wales, and resolutions endorsing these changes were carried by a small majority.

Official statements indicate that great progress took place in agriculture and dairy farming during the year, that mining and manufactures had steadily advanced and that the condition of the colony on the whole was prosperous. The revenue and expenditure for the year 1898 was estimated at £9,433,000 and £9,681,000, respectively. It was proposed by the government to meet the deficit by the imposition of certain new customs duties.

NEWTN, SAMUEL, D. D., English mathematician and Biblical scholar, died February 1, 1898. He was born in 1821. At the age of thirty-four he became a member of the faculty of New College, London, the well known Non-Conformist institution, and in 1872 was made principal, assuming at the same time the professorship of New Testament Exegesis, in which positions he remained until he was succeeded in 1889 by the present principal, the Rev. R. Vaughan Pryce, M. A. Dr. Newth, who was an able scholar and instructor, published a number of works, but will be best remembered perhaps for his success in preparing students for the ministry. He was an important member of the New Testament Revision Committee and in 1880 was Chairman of the Congregational Union of England and Wales. His grave is in Abney Park Cemetery near that of his friend and co-worker, Dr. Henry Allon.

NEW YORK, a Middle Atlantic State of the United States, has an area of 49,170 sq. m. Capital, Albany.

Mineralogy.—In 1897 New York maintained its rank as the first salt-producing State in the country, with a total output from 43 works of 6,805,854 barrels, value,

\$1,948,759. The production has increased rapidly since 1892, when the total was 3,472,073 barrels. Only two of the works are rock-salt mines. The State ranks fourth in quarry interests and third in the value of limestone, the value of all quarry products being \$3,072,940, and that of limestone, \$1,697,780. Sandstone, granite, and marble were next in value, respectively. In iron ores there was an aggregate output of 335,725 long tons, value \$642,838, principally magnetite. Gypsum yielded 33,440 short tons, value, \$78,684; and St. Lawrence county continued to supply the only fibrous talc found in the country, yielding 57,009 short tons, value, \$396,936, an increased production and decreased valuation. The approximate value of natural gas produced in the State was \$200,000, a decline in a year of nearly \$50,000; and the product of crude petroleum, 1,279,155 barrels, value, \$1,005,736. For the clay and cement industries see paragraph Manufactures, and the article FULLER'S EARTH.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 15,671,535 bushels, value \$6,738,760; wheat, 8,036,263, \$5,786,109; oats, 38,726,545, \$12,005,229; barley, 4,341,935, \$2,084,129; rye, 4,014,395, \$2,007,198; buckwheat, 4,068,103, \$1,830,646; potatoes, 24,300,605, \$10,206,254; and hay, 6,419,462 tons, \$36,911,906—total value, \$73,478,873. The State ranked first in the production of hay and potatoes, second in buckwheat and rye, and sixth in barley and oats. Live-stock comprised, horses, 596,738; mules, 4,421; milch cows, 1,458,251; other cattle, 561,077; sheep, 841,955; and swine, 645,237—total head, 4,107,629. The State ranked first in the number of milch cows.

Manufactures.—In 1897 the various clay-working industries had 311 plants and a gross output valued at \$5,615,504, of which \$5,432,239 represented brick and tile work; and the cement industry had 7 plants and a production of 394,398 barrels, value, \$690,197, all of the Portland grade. During the fiscal year ending June 30, 1898, the taxable manufactures of the State yielded the Federal government \$21,053,569 in internal revenue. The tobacco industry had an output of 1,061,719,175 cigars, 2,206,189,964 cigarettes, 2,473,245 pounds of plug, 1,866,496 pounds of fine cut, 11,804,851 pounds of smoking, and 121,802 pounds of snuff. There were 45 distilleries of all kinds in operation. The production of spirits was 2,555,237 gallons, principally alcohol, and of fermented liquors, 10,090,754 barrels.

Commerce.—During the fiscal year ending June 30, 1898, the imports of merchandise at the various ports aggregated in value, \$417,138,294; exports, \$473,205,936. The movement of gold and silver was, imports, \$98,983,503; exports, \$58,375,071—making the total foreign trade of the State, \$1,047,702,804.

Transportation.—On Jan. 1, 1898, the length of the various steam railroad lines in the State was 8,241.15 miles. About 30 miles of new main track was laid down in the previous year. The gross earnings of all roads, in the year ending June 30, 1898, were \$9,797,599 larger than in 1897; the operating expenses, \$7,409,313 greater; the net earnings, \$2,388,285; and the percentage of dividends to capital stock, 2.39. The casualties of the year were 700 persons killed and 1,507 injured. The total number of passengers carried by steam surface roads was 149,253,259; by street surface roads, 849,310,670; by elevated roads, 227,776,552. The steam surface roads employed 140,992 persons and paid them \$83,451,437 for wages; street surface roads, 25,052 persons, \$13,080,651 wages and salaries; elevated roads, 7,018 persons, \$4,696,616 wages. During the season of 1897 the State canals had an aggregate freight tonnage of 3,617,804, a decrease in a year of nearly 100,000 tons; and in the season of 1898 the Erie canal had grain shipments aggregating 20,844,783 bushels, a considerable decrease from those of the two previous years.

Banks.—On Oct. 31, 1898, there were 327 national banks in operation and 150 in liquidation. The active capital aggregated \$83,244,840; circulation, \$38,915,017; deposits, \$719,755,515; reserve, \$190,200,195; resources, \$1,051,464,802. The State banks, July 23, 1898, numbered 210, and had capital, \$30,014,200; deposits, \$192,426,103; resources, \$293,688,677; surplus and undivided profits, \$27,302,672; loan and trust companies, 44, with capital, \$33,000,000; deposits, \$383,328,723; resources, \$483,739,925; and private banks, 14, with capital, \$310,000; deposits, \$3,174,867; resources, \$3,720,616. There were also 131 mutual savings banks, which had (July 1, 1898) open accounts, 1,823,631; deposits, \$787,212,475; resources, \$889,250,317; surplus, \$101,671,213. The amount of interest credited and paid in the year was \$27,350,719. All of these items excepting surplus showed large gains over the totals in the report for Jan. 1 preceding. Building and loan and co-operative savings and loan associations numbered 370, of which 361 reported shares in force, 1,615,663; mortgage loans, \$38,683,578; assets, \$61,584,719. In the year ending Sept. 30, 1898, the exchanges at the U. S. clearing-houses at New York, Buffalo, Rochester, Syracuse, and Binghamton, aggregated \$40,235,615,985, an increase of \$8,548,743,705 in a year.

Education.—In a comparative statement of statistics for the school-year 1898 the State Superintendent of Public Instruction reported a decrease in the number of children of school age in the State of 150,141. All of this decrease was reported from New York City, and the Superintendent believed that the figures collected were incorrect. The number of school districts in the State were 11,752; children of school

age, 1,518,808; children attending school some portion of the year, 1,168,994; value of public school property, \$71,832,511; total expenditures, \$28,475,871; number of private schools, 901; children attending private schools, 81,448. According to the report of the State Board of Regents, the various colleges, universities, professional, technical, and other special schools, had a total of 29,801 students, classified as follows: colleges for men, 3,489; colleges for women, 2,705; colleges for men and women, 2,807; law, 2,218; medicine, 3,582; pharmacy, 635; dentistry, 438; eye and ear, 11; veterinary, 90; theology, 820; education, 1,257; music, 766; other special lines, 10,977. The secondary schools under the supervision of the board had 66,342 students. The colleges and professional schools had an aggregate of 1,202,634 bound volumes in their libraries, and the public and private secondary schools, 790,077. Periodicals numbered 2,018, of which 183 were dailies, 1,112 weeklies, and 559 monthlies.

State Charities.—The State Board of Charities reported for 1898 that the number of inmates and beneficiaries of the institutions, societies, and associations included within the jurisdiction of the board, exceeded 2,500,000, and the cost of their maintenance was nearly \$22,000,000 per annum. The State institutions had 71,013 inmates and beneficiaries, and the total appropriation recommended for the institutions was \$1,515,415. The public and private charities in the State subject to the supervision of the board have an annual income of over \$23,000,000, and own real and personal property conservatively estimated to be worth \$103,000,000.

Government.—The legislature of 1898 created the new county of Nassau on Long Island, to go into legal existence Jan. 1, 1899, and Mineola was selected for the county seat. The State has now 61 counties.

Finances.—The report of the State Treasurer, Jan. 1, 1899, showed: Balance, Jan. 1, 1898, \$1,654,225; receipts in fiscal year ending Sept. 30, 1898, \$30,488,406; disbursements in same period, \$33,757,981; balance, Sept. 30, 1898, \$3,973,804. Inheritance, corporation, organization, and liquor taxes yielded \$8,710,735, the last, \$4,216,278. The assessed valuations were: real estate, \$4,349,801,526; personal property, \$649,364,694—total, \$4,999,166,220; as equalized by the State board, real estate, \$4,349,801,526; personal property, \$548,809,493—total, \$4,898,611,019, an increase over that of 1897 of \$391,625,325. The State tax rate was \$2.08 per \$1,000, and the total levy, \$10,189,111, a decrease in rate and levy.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 7,100,000. Local estimates gave the Greater New York, 3,549,550; Buffalo, 400,000; Rochester, 177,000; Syracuse, 130,000; Albany, 100,000; Troy, 65,000; Utica, 60,000; Binghamton and Yonkers, each 45,000; Elmira, 42,000; Schenectady, 27,000; Poughkeepsie, 25,000; Cohoes, 24,000.

The Greater New York.—On the first of January, 1898, the Greater New York Law came into effect, consolidating the county of Kings, the county of Richmond, Long Island City, the towns of Flushing, Newtown, and Jamaica, and that part of Hempstead in Queens county west of a straight line drawn from the southeasterly point of the town of Flushing through the middle of the channel between Rockaway Beach and Shelter Island, in the county of Queens, to the Atlantic Ocean. The city thus consolidated is divided into five boroughs—Manhattan, the Bronx, Brooklyn, Queens, and Richmond. The city thus created has an area of 306 sq. m. and contains a population of over three and a half millions. Robt. A. Van Wyck was the first mayor. The new city is governed by a Municipal Assembly consisting of two houses, the Council and Aldermen.

The Canal Scandals.—On March 17, 1898, Governor Black, in accordance with an act of legislature, appointed a commission to investigate the expenditure of the \$9,000,000 voted by the people in 1895 for enlarging and improving the Erie, Champlain, and Oswego canals. The report made Aug. 1, declared that \$1,000,000 at least had been improperly spent and that not less than \$1,500,000 had been used on ordinary and extraordinary repairs belonging to canal maintenance and for which nothing should have been taken out of the special appropriation. It also stated that the total cost of completing the proposed improvements would be \$21,000,000. The responsibility for the abuses was deemed by many to rest upon State Engineer Adams and Superintendent Aldridge. The latter resigned his office of Superintendent of Public Works early in December. See CANALS (paragraph Boat Canals).

Legislation.—Control of Elections.—An important law was passed in New York State in 1898 with the design of centralizing the control of elections, but with the ulterior motive, it was said, of securing party advantage. A metropolitan election district, including Greater New York and the outlying portions of the five counties in which the city is situated, was created. The appointment of a superintendent of elections in this district rests with the Governor. The superintendent, whose term of office is four years, is to appoint an equal number of deputies from each party upon nomination by the party's committees, and is to have a general power of supervision, with a view to detecting fraud, as well as the general management of the work of registration and election. The law provides that one deputy from each party is to be present at each polling place during the time when the voting and canvassing are going on.

New York showed the effect of the recent movement for the reform of primary elections. A new law provides that every voter upon registration shall have a chance to enroll himself as an intending participator in the primaries upon taking oath in case of challenge that he is in sympathy with the principles of the party, and has not been enrolled for or voted in any other primary within a year. The voter's choice of party is to be kept secret at first but the complete lists of enrollment are to be made public before the date of the holding of the primary. The law also provides that the expense of the primaries shall be met out of the public treasury and that the election shall be conducted by the officers who conduct the general elections. It is further provided that the ballots shall be prepared in a certain form. This law operates in all cities of 100,000 inhabitants or more, and it may be adopted in any city or village of over 5,000. Enrollment must take place between April 15 and 30 inclusive, with a supplementary enrollment on the second Tuesday in May. On the first Tuesday in June, official primaries must be held to elect a new County Committee, to elect delegates to the State, or to conventions by which delegates to State conventions are to be elected, and to Congressional conventions if the County Committee so elects. On the second Tuesday in June the new County Committees must be organized. The second Tuesday in September is "annual primary day," when there shall be elected all party committee-men, other than members of the General County Committee, also delegates to the State conventions and conventions called to elect delegates to the State convention, and also excepting Congressional conventions. Any voter may also enroll as a member of his party on the days of registration in October, at the same time that he registers as a voter.

City Government.—Another important act relative to city government was the statute regulating the government of cities of the second class, namely, from 50,000 to 250,000 inhabitants, including Syracuse, Rochester, Albany, and Troy. This measure framed three years before had previously failed of passage. It draws the line clearly between legislative and executive powers, and tends to increase the authority of the Mayor. To the city council is given "authority to enact ordinances not inconsistent with the laws of the State for the government of the city and the management of its business, for the preservation of good order, peace, of health, for the security and welfare of its inhabitants, and the protection and security of their property." Thus the powers of the council are not expressly limited, as has usually been the custom. The City Council is to consist of a single board of unpaid men chosen from each ward for the term of two years, the Mayor, as the chief executive officer, having full power of appointment of all the members of departments except the comptroller, treasurer, and assessors, who are elected. His term and that of his appointees is two years. He may remove officials at pleasure. Financial measures originate with the executive officers, there being an ex-officio board of estimate and apportionment consisting of the Mayor, the Comptroller, Corporation Counsel, President of the Council, and City Engineer, and the power of the City Council is limited in this respect to the reduction or striking out of items in the estimates. The charter provides that all franchises and leases of public property shall be sold at auction to the highest bidder upon terms approved by the board of estimate and after a favorable vote on the part of at least three-fourths of the members of the Council. Such franchises or leases are limited to the term of fifty years.

Purchase of Art Works.—Legislation was effected which authorized cities of the first and second class to purchase works of art which must be produced in the United States by professional artists who are citizens of the United States. These productions are to include mural paintings or decorations which artists may be employed to place upon the walls of public buildings, and cities of the first class may spend \$50,000 annually for the purpose. Provision is also made for the appointment of art commissioners for the purpose. Women may be included among the commissioners.

The Display of the Flag.—A bill provided that the United States flag should be displayed upon or near every public school building during school hours and at such other times as the school authorities should direct; that a programme providing for a salute to the flag at the opening of each day of school, and such other patriotic exercises as may be deemed by the State Superintendent to be expedient, should be prepared by him; also that he should make special provision for the observance in public schools of Lincoln's and Washington's birthdays, Memorial Day, Flag Day, and such other holidays of like character as may be designated by law.

Other Legislative Measures.—A law was passed declaring that failure to pay taxes is not to be punished as a contempt nor as misconduct. Fines are not to be imposed for non-payment of taxes. In July, \$1,000,000 was appropriated for the National Guard and State Naval Militia and volunteers furnished by the State for the war. A law was also passed enabling an absent soldier to vote just as if he were at home. Only New York, New Jersey, Massachusetts, Rhode Island, Georgia and South Carolina now have annual sessions of the legislature, and the New York legislature of 1898 adopted a resolution referring to the legislature of 1899 a constitutional amend-

ment providing for biennial sessions. Another amendment to the constitution, discussed in 1898 but not submitted to the people, was the proposal that the enactment of "riders" on appropriation bills should be prohibited. An appropriation was made to aid in the permanent establishment of the beet sugar industry in the State.

Claims Against the State.—During the year 1898, the claims against the State aggregated \$491,533. The State Court of Claims awarded \$101,469. In the twelve months 1,406 claims were filed with the court amounting to \$1,394,126 exclusive of interest. The interest will bring them up to about \$2,000,000.

The Libraries.—The free travelling library system is flourishing. During 1898, 540 libraries were sent out, making a total of 1,723 used since 1893; and the whole number of volumes set apart by the State Library for the purpose is about 40,000; the cost of maintenance was less than \$10,000. In 1893 there were 14 applications for such libraries, 139 in 1894, 212 in 1895, 348 in 1896, 438 in 1897, and 540 in 1898. From the duplicate department of the State Library and from books specially given or bought for the purpose, 100 books may be lent for six months to the trustee of any public library in the State, on payment of \$5. If there is no library they may be lent on petition of twenty-five resident taxpayers, one of whom must be an owner of real estate and must act as trustee and be personally responsible for the books. Fifty volumes may be had for \$3. These libraries do not contain books of reference or periodicals.

Political Affairs and Elections.—The Democratic Convention selected Augustus Van Wyck (q. v.), brother of the Mayor of New York, as its candidate for Governor. It declared adherence to the principles of Jeffersonian Democracy and alluded to the lowering of standards in State government by the scandals and abuses of the Republican administration. The Republican Convention selected Col. Theodore Roosevelt (q. v.), and declared for the gold standard, besides endorsing the protective tariff. The political campaign was somewhat listless at first, but the candidacy of Judge Daly for re-election led to a sharp contest over the question of the independence of the judiciary. Mr. Richard Croker, the Tammany leader, opposed the re-election of Judge Daly, because he had refused to appoint Michael T. Daly a clerk of his court. Mr. Croker said: "Judge Daly was elected by Tammany Hall, after he was discovered by Tammany Hall, and Tammany Hall had a right to expect proper consideration at his hands." The attitude of Tammany Hall on this question helped the Republicans, who took Judge Daly as their candidate. Judge Van Wyck made an issue of the canal scandals and denounced the Raines' Liquor Law as "partisan in its purposes and oppressive in many directions." He stated that he was in complete accord with the biennial-sessions amendment and commended the declaration in favor of honest civil-service laws. The election resulted in the victory of Roosevelt by 660,094 votes against 642,015 for Van Wyck, a plurality of 18,079; but in the defeat of the Republican judiciary ticket. In the Congressional elections the Democrats had a net gain of twelve seats.

National Representatives and State Officers.—New York's Representatives are: T. B. Scudder (Dem.), from Glenhead; John J. Fitzgerald (Dem.), from Brooklyn; Edmund H. Driggs (Dem.), from Brooklyn; Bertram T. Clayton (Dem.), from Brooklyn; Frank Wilson (Dem.), from Brooklyn; Mitchell May (Dem.), from Brooklyn; Nicholas Muller (Dem.), from New York; Daniel J. Riodan (Dem.), from New York; Thomas J. Bradley (Dem.), from New York; Amos J. Cummings (Dem.), from New York; William Sulzer (Dem.), from New York; George B. McClellan (Dem.), from New York; Jefferson M. Levy (Dem.), from New York; William Astor Chandler (Dem.), from New York; Jacob Ruppert, Jr. (Dem.), from New York; John Q. Underhill (Dem.), from New Rochelle; A. S. Tompkins (Rep.), from Nyack; John H. Ketchum (Rep.), from Dover Plains; A. V. S. Cochrane (Rep.), from Hudson; Martin H. Glynn (Dem.), from Albany; John K. Stewart (Dem.), from Amsterdam; Lucius N. Littauer (Rep.), from Gloversville; Louis W. Emerson (Rep.), from Warrensburg; Charles A. Chickering (Rep.), from Copenhagen; James S. Sherman (Rep.), from Utica; George W. Ray (Rep.), from Norwich; M. E. Driscoll (Rep.), from Syracuse; Sereno E. Payne (Rep.), from Auburn; Charles W. Gillet (Rep.), from Addison; James W. Wadsworth (Rep.), from Genesee; T. M. E. O'Grady (Rep.), from Rochester; William H. Ryan (Dem.), from Buffalo; D. S. Alexander (Rep.), from Buffalo; and Warren B. Hooker (Rep.), from Fredonia. Senators: Thomas C. Platt (Rep.), from Oswego; and Chauncey M. Depew (Rep.), from New York. State officers: Theodore Roosevelt, Governor; Timothy L. Woodruff, Lieutenant-Governor; John T. McDonough, Secretary of State; John P. Jaekel, Treasurer; John C. Davis, Attorney-General; William T. Morgan, Comptroller; Charles R. Skinner, Commissioner of Education; Edward A. Bond, State Engineer and Surveyor; Louis F. Payn, Superintendent of Insurance; Frederick D. Kilburn, Superintendent of Banking; and Cornelius V. Collins, Superintendent of State Prisons. Chief-Justice, Alton B. Parker (Dem.); Associates, Albert Haight (Rep.), John C. Gray (Dem.), Irving G. Vann (Rep.), Edward T. Bartlett (Rep.), Dennis O'Brien (Dem.), and

Celora E. Martin (Rep.) ; Clerk, William H. Shankland. There are 27 Republicans, 21 Democrats, and 2 doubtful members in the State legislature.

NEW YORK ACADEMY OF SCIENCES, organized in 1817, has now 672 members. It meets monthly at Mott Memorial Library, 64 Madison avenue, New York. There are the Astronomy and Physics section; the Biology section; the Geology and Mineralogy section; and subsections of anthropology, psychology, and philology. President, John J. Stevenson; Secretary, James F. Kemp, Columbia University. See ZOOLOGICAL SOCIETIES.

NEW YORK BOTANICAL GARDEN. See BOTANY (paragraph Botanical Gardens).

NEW YORK CHAMBER OF COMMERCE, organized April 5, 1768, incorporated by George III, March 13, 1770, and re-incorporated by the State of New York April 13, 1784. The original charter after declaring that "numberless inestimable benefits have accrued to mankind from commerce; that they are, in proportion to their greater or lesser application to it, more or less opulent and potent in all countries; and that the enlargement of trade will vastly increase the value of real estates as well as the general opulence of our said colony," states that its object is "to carry into execution, encourage, and promote by just and lawful ways and means, such measures as will tend to promote and extend just and lawful commerce." There are 1,250 members. President, Alexander E. Orr; Secretary, George Wilson.

NEW YORK CITY. See NEW YORK.

NEW YORK PUBLIC LIBRARY, ASTOR, LENOX and TILDEN FOUNDATIONS, was consolidated in 1895, on condition that the new corporation should establish and maintain a free public library and reading room with branches in New York, and should carry out the other stipulations of the trustees of the Astor and Lenox libraries and of the Tilden trust. The new trustees number 21. John Bigelow, President; Geo. L. Rives, Secretary; Edward King, Treasurer; Jno. S. Billings, Director. The present buildings are at 40 Lafayette Place, and at the corner of 70th street and Fifth avenue. The total endowments, in addition to buildings and sites, amount to \$941,266.99. The library is open from 9 A. M. to 6 P. M. The new building is to occupy the site of the reservoir at Fifth avenue and 40th to 42nd streets, the cost is not to exceed \$2,500,000. The city appropriated \$1,000,000 for 1899.

During the six months ending December 31, 1898, the total number of books catalogued and accessioned was 15,082, and of pamphlets, 11,055, as against 14,124 volumes and 11,472 pamphlets, during the same period of 1897. The total number of cards made for the catalogue was 126,250, and 6,752 slips were written for the printer. The total number of readers was 50,113, the daily average being 321, and the number of volumes used 177,783, as against 47,880 readers (an average of 314), and 158,749 volumes in the last six months of 1897. During the calendar year ending December 31st, 1898, the total number of volumes catalogued and accessioned was 32,835, of which 20,506 were purchases and 12,329 gifts; while the number of volumes actually received was 25,917, of which 15,252 volumes were purchases and 10,665 were gifts. The total number of pamphlets catalogued and accessioned was 21,074, of which 5,984 were purchases and 15,090 gifts; and the number of pamphlets actually received was 33,196, of which 4,196 were purchases and 29,000 were gifts. The total number of cards in the Index Catalogue at the close of the year, in the Astor Branch, was 308,549,—68,649 of which were added since the first of July. The total number of readers during the year was 106,098, and the number of volumes consulted was 357,827, not including those used at the free reference shelves. The above mentioned accessions make the number of volumes in the library at the close of the calendar year 440,148 and the number of pamphlets 111,055.

NEW YORK UNIVERSITY, in New York City, was chartered in 1831. It is co-educational in the Schools of Law and Pedagogy, and in the Graduate School. In the summer of 1898 it granted 337 degrees, as follows: The University College of Arts and Sciences and the School of Engineering, at University Heights, 26 degrees in arts and science; the Graduate School, one half at University Heights and half at Washington Square, 28 degrees of Master of Arts, 4 of Master of Science, and 5 of Doctor of Philosophy. The School of Pedagogy at Washington Square, 21 degrees of Master of Pedagogy, and 6 of Doctor of Pedagogy; the School of Law at Washington Square, 117 degrees of Bachelor of Laws, and 16 of Master of Laws; and the Medical school, known as the University and Bellevue Hospital Medical College, at First avenue and East Twenty-sixth street, granted in the summer of 1898, 104 degrees of Doctor of Medicine. Besides these degrees, Chancellor's Certificates were given for work in University Extension courses. The whole number of students enrolled in the fall of 1898, was 1736. The six Faculties together enrolled 167 officers and instructors. A notable movement of the year was toward the founding of a School of Public Health, largely on the lines of a similar school in the University of Edinburgh. The plan

involves the granting of \$25,000 annually by New York State, in return for which the school will give free instruction to one accredited member of each city, village or township Board of Health throughout the State, and also render other State service. The University undertakes to furnish grounds and buildings sufficient for the school valued at over \$200,000. Provided the necessary legislation is secured in time the school will open in October, 1899. A movement was also begun in 1898 towards the broadening of the School of Engineering at University Heights into a School of Applied Science, granting instruction in civil, mechanical and chemical engineering, and applied chemistry. This school will be opened in October, 1899. Effort was begun in 1898 for enlarged halls for the School of Pedagogy. A subscription was begun which will secure an entire story comprising about 16,000 square feet of floor space in the University Building at Washington Square. The year 1898 was marked by the successful opening of the consolidated Medical College formed by uniting the Bellevue and University Colleges. The new building costing, with the grounds, over \$200,000, was completed, and 430 students were matriculated. The two Colleges claim together over 10,000 alumni scattered throughout the world. The gifts to New York University for 1898 were about a quarter of a million dollars. The Chancellor is Henry Mitchell MacCracken, D. D., LL. D. See UNIVERSITIES AND COLLEGES.

NEW YORK ZOOLOGICAL SOCIETY. See ZOOLOGICAL SOCIETIES.

NEW ZEALAND. A group of islands in the southern Pacific belonging to the British Empire having an area estimated at 104,471 sq. m. with a population in 1896 of 703,360, exclusive of aborigines. The two largest islands are Middle Island with an estimated area of 58,525 sq. m. and North Island with an estimated area of 44,468 sq. m. The seat of government is Wellington but the largest city is Auckland (57,516, including suburbs). The population, which increased very rapidly in the earlier years owing to the excessive immigration is now increasing gradually. The immigration in 1893 was exceedingly large, being 26,135, an excess of 10,412 over emigration; in 1896 the immigration was 17,236, but in 1861 was only 1,472. The soil is often clayey but fertile in the volcanic districts. Agriculture is followed with success and the acreage under crop has greatly increased, rising from less than 30,000 in 1851 to 11,553,509 in 1897, the chief crops being wheat, oats, barley and hay. The raising of live-stock is also important. In 1897 there were in the colony 249,732 horses, 1,138,572 cattle, 19,138,493 sheep and 209,853 pigs, besides large numbers of other domestic animals and poultry. Mining is very important, the mineral resources including gold, coal, silver, antimony ore, manganese ore and kauri gum. Of these the most valuable is gold, the production in 1896 being £1,041,428. As to commerce, the chief countries with which New Zealand trades are the United Kingdom, the Australian colonies, the United States and the islands of the Pacific. The exports, of which the main items were wool, gold, frozen meat, kauri gum, grain, butter and cheese, were valued in 1897 at £10,016,993. The imports consisting largely of British manufactures, were valued in that year at £8,055,223. The expenditure for 1897-98 was estimated at £4,912,372 and the revenues at £5,079,230. In 1897 the net public debt was £43,552,324. The railway mileage in 1898 was placed at 2,222 miles, of which the greater part was in the South Island. Less than 200 miles were owned by private companies, the rest being the property of the government. In 1897 there were 16,471 miles of telegraph wire. The administration is in the hands of a Governor appointed by the crown and a responsible ministry. The legislative authority is vested in a legislative Council whose members are nominated by the Governor and a House of Representatives chosen by the people. In 1898 the Governor was the Rt. Hon. the Earl of Ranfurly and the Premier the Rt. Hon. R. J. Seddon.

Events of 1898.—The financial condition of the country was officially reported as sound and it was stated on August 9 that the revenues had yielded a surplus of £521,000. The government now proposed in view of this to remit 5 per cent. of the duties levied upon British manufactures and to request Parliament to sanction the old age pension plan. A bill having this object in view provided that every person 65 years of age or more who had resided in the country for 25 years and possessed an income of not more than £34 a year, should be entitled to a pension of £18 a year. The bill was passed on October 20. Early in the year what promised to be a serious uprising took place among the Maori natives in the north of New Zealand in consequence of an attempt to levy direct taxes upon them. Resistance was offered to the imposition of the dog tax but the movement was promptly crushed and the ring-leaders were captured.

The Old Age Pension Act.—As an attempt at social reform which is strongly advocated by certain thinkers especially in Great Britain, it may be of interest here to give a further account of the origin and nature of the measure. The effort to secure a system of old age pensions dates in New Zealand from the year 1895-6. The principle of the measure was generally conceded, and the main question was its practicability. The idea of it is that the aged poor of the country should not be left to starve, and while it savors of socialism it is in the line with much legislation that has

already been passed in the most advanced countries. There was an old age pension bill introduced in the New Zealand Parliament in 1896, but it was crude in conception and defective in detail. It was rejected, and a similar measure was thrown out in 1897. In 1898 a new bill was introduced showing some improvements on the old ones. The main difficulty in framing it was to determine the amount of the pension and by whom it should be received. It was finally decided after debate that the pension should amount to £18 a year, or about a shilling a day. And as to the recipients the principle was adopted that only those in actual want should receive it. Another question was, what should be the age of the beneficiaries. It was decided that sixty-five years should be the limit. Again, the Parliament had to decide upon what degree of poverty was to constitute the qualification for the receipt of a pension, and on this point the act provided that the pension should be £18 per year diminished by "(1) one pound for every complete pound of income above 34 pounds; (2) also by one pound for every complete 15 pounds of the net capital value of all accumulated property computed and assessed as next hereinafter provided." It was a hard matter to determine who were the deserving poor, as it was not desired to turn New Zealand into an asylum for the undeserving poor of other nations. The benefits of the act were withheld from aliens, Asiatics, lunatics and criminals. It was attempted to introduce a character test and under the act a claimant must prove that he is of good character and has lived a reputable life for the five years immediately preceding the time of his application, nor can he obtain a pension if convicted of certain offenses. According to the government estimate the cost of the pension is £120,000 a year. This sum was made not by increase of taxation but out of a surplus which had accumulated during the preceding five years. The administration of the act was entrusted to registrars and deputy-registrars. The claimant is required to prove his claim before the magistrate in open court, after which he obtains the pension certificate. These are the main features of the act; but, as it was passed in 1898, it is too early yet to determine the effect of its operation.

NICARAGUA, a republic of Central America, comprising 13 provinces, whose aggregate area is estimated at 49,200 square miles and whose population, including about 40,000 uncivilized Indians, is placed at 420,000. The inhabitants are chiefly Indians, mixed races, mulattoes, and negroes, the number of those of pure European descent being only about 1,200. The capital is Managua (population about 18,000); other towns of importance are Leon (pop. 34,000), Bluefields (2,100), San Juan del Norte (1,500). Roman Catholicism is the prevailing religion; in 1894 there were reported 1,020 schools with about 20,000 pupils.

The report of the Nicaragua Canal Commission, contains a valuable paper on the geography, and physiography of the lake region of Central America, by C. W. Hayes. The region reported on contains two types of topography, i. e., recent volcanic mountains, and plateaus, in which the original structural features are more or less well preserved, and areas of tertiary, igneous and sedimentary rocks, in which the forms are due to long continued sub-aërial erosion. A marked feature is the absence of any well developed mountain range or chain of peaks, and no rocks older than the tertiary are found along the line of the canal. Throughout the area described, the rocks are decomposed to a depth of from 50 to 150 ft. Several upward and downward movements of the land took place during the tertiary time.

Government.—By the constitution proclaimed July 4, 1894, the chief executive authority is vested in a President who is elected for four years and who exercises his functions through a Cabinet, responsible to Congress, representing the Departments of Foreign Affairs and Public Instruction, Interior, Justice, War, and Marine; Public Works and Finance. The President (1894-98) is General Don José Santos Zelaya. The legislative authority devolves upon a Congress of one House, the members of which are forty in number and are elected by popular vote for a term of two years. In 1896 Nicaragua, Honduras, and Salvador formed the Greater Republic of Central America, to simplify foreign relations and to lead to the ultimate unification of the Central American Republic. (See CENTRAL AMERICA.) The figures given for the army are: active, 2,000 men; reserve, 10,000; militia, 5,000.

Finance.—There are no trustworthy statistics for recent revenues and expenditures. The revenue is derived mainly from government monopolies on gunpowder, spirituous liquors, and tobacco, and from import and export duties. Besides the payment of interest on the national debt the chief expenditure is for the army. The outstanding foreign debt in 1897 aggregated \$1,433,411. In 1894 the internal debt was 7,000,000 pesos (\$3,052,000) and in November 1896, there was issued a new loan for 500,000 pesos (\$218,000). The peso was valued (October 1, 1898) at \$0.436 United States currency.

Industries and Commerce.—The chief industries are cattle-raising and the cultivation of coffee, sugar, and bananas; but only a small portion of the land is tilled. In 1891 there were in the country 100 mines, worked by American companies, and producing gold, silver, and copper. The gold export in 1895 amounted to 8,000 ounces. Coffee, hides, and mahogany are among the principal exports; the chief imports

are textiles and iron goods. About two-thirds of the foreign trade passes through Corinto. Accurate commercial statistics have not been reported. The following statements, however, regarding Nicaraguan trade in 1897 are gathered from a general report of the British Consul, Mr. W. J. Chambers. Commercial conditions at the time of the report seem to have been unsatisfactory largely on account of a fall in the price of coffee and of silver. The total imports including those from other Central American States were \$2,567,946, being a decrease from the imports of the previous year of \$767,880. There was a considerable shortage in all the European trade and an increase of about 2 per cent. in United States trade, which country, it is said, alone exports to Nicaragua petroleum, rice, breadstuffs, and potatoes. The exports in 1897 amounted to \$2,972,050, which is \$2,022,469 less than the exports of 1895. This is also explained by the lower price of coffee, but there was likewise a falling off in other native exports. Some products showed an increase, including fine woods and dyewoods and gold; the cacao industry was on the increase. The Atlantic trade of Nicaragua is largely with the United States, the greater part of it passing through the port of New Orleans. During 1898 the industry of evaporating bananas, which almost seems to be peculiar to the Greytown district of Nicaragua, was developed.

In September 1898, the tariff law of July 25, 1888, was repealed, and a new law increasing the tax on imports on an average 100 per cent., went into effect. Strangely, San Juan del Norte, which is a "free port," is exempted from tariffs, but the new duties are levied at all other ports.

Forest Concession.—In 1898 a contract was made between the Nicaraguan government and Mr. H. C. Emery, of Chelsea, Massachusetts, by which the latter was privileged to cut and export the valuable woods of the country. This contract, which was really the renewal of a former agreement according to which Mr. Emery exported about 12,500 logs a year, gave him a monopoly in the fine wood trade over a large area. According to the contract Mr. Emery must build for his own use fifty miles of railway extending through Matagalpa between Rio Grande and the Pearl Lagoon, and the equipments for carrying on the enterprise—including the road, bridges, wharves, etc.—must meet the approval of the Minister of Public Works. To Mr. Emery is ceded 17,500 acres of public lands in Matagalpa, and for each tree cut he must, within a year, plant another. The contract provided that he make the government a gold payment of \$20,000 and pay over to it an annual premium of \$10,000. He is exempted from import tariffs on goods necessary for establishing and maintaining the enterprise. The contract is to stand for fifteen years, at the end of which time the property will revert to the government.

Communications.—In 1898 there were two lines of railway open, and others under government construction. One line, 58 miles long, connects the Pacific port Corinto with Momotombo, and the other, 33 miles long, is between Managua and Granada. The total 91 miles cost 2,700,000 pesos. There are about 1,250 miles of telegraph; the telegraph offices and post-offices number each about 60. There are few good wagon roads in the country.

History.—In the fall of 1897 trouble arose in Nicaragua culminating on September 17 in an attempted revolution in the province of Granada. Although this was suppressed in a week by President Zelaya, the trouble was not at an end and the rebellion broke out afresh in the following January, and matters were further complicated by President Zelaya's charges that the rebels had received aid from Costa Rica. The unrest of the people had been further augmented by a proposition for large issues of paper currency, based, it was said, "upon mortgages on improved real estate in Nicaragua." Ill feeling between the two republics increased with the continued discussion of the long unsettled boundary question, which involved that part of the country embracing the western terminus of the proposed Nicaragua Canal; the claim of Costa Rica placed the boundary line about fifty miles to the north and thus brought this part of the canal into her territory. On March 1, Costa Rican troops were ordered to the frontier; a number of skirmishes were reported, and early in April President Rafael Yglesias, of Costa Rica, went to the front and assumed personal command of the army. Actual war seemed imminent and much surprise was created when it was averted by a preliminary treaty of peace which was signed April 26. The boundary question was left to an arbitration commission, which sustained the claims of Nicaragua. For an account of the short-lived "Republic of Central America," and of Nicaragua's relations thereto, see the article. CENTRAL AMERICA.

NICARAGUA CANAL. In the latter part of 1898 interest was revived in the Nicaragua Canal project. During the year a commission, headed by Admiral Walker, was at work in Nicaragua preparing a report to be made to the next Congress; the work of the commission was carried on by about two hundred and fifty experts and explorers who made every investigation that was necessary and possible concerning climate, soil, topography, and the entire work of construction. In

December, 1898, it had nearly completed its labors. See the article UNITED STATES (President's Message).

From the engineering point of view the commission agreed upon the feasibility of the project. For this phase of the subject and for the legislation already accomplished see the article CANALS (paragraph Ship Canals). The question, as discussed in 1898, comprised chiefly two aspects, the international phase and the industrial phase. The former was resolved especially into a discussion of the Clayton-Bulwer treaty made with Great Britain in 1850. By the terms of this treaty neither England nor the United States shall ever "obtain exclusive control over the [Nicaragua] canal, or build any fortifications along its route" or "take possession of any part of Central America, establish any colonies there, or exert any dominion." It was also agreed that all possible efforts should be made to bring about the construction of the canal, that the canal, if constructed, should be neutral and always open to both nations, and that, in case of war between the two, warships of either country should pass freely through it. It was further provided that both governments invite all civilized nations to become partners to the terms of the treaty so that the canal would for a certainty be a neutral waterway for the commerce and national interests of the world.

When a few years after the ratification of the treaty it was discovered that by it England had relinquished almost nothing, there was a popular call for its abrogation on the ground of misunderstanding, but President Buchanan obtained a few concessions from England and the treaty has thus stood down to the present time. The plan for canal construction, however, was not relinquished by Americans.

President Grant made strenuous efforts for the furtherance of the canal project, which were continued during the administrations of Presidents Hayes, Garfield and Arthur; during the last named administration Secretaries of State Blaine and Frelinghuysen attempted in vain to secure the abrogation of the Clayton-Bulwer Treaty, and at one time it seemed not improbable that the United States government would ignore the treaty and construct the canal, assuming a protectorate over Nicaragua. President Cleveland, however, instituted a change of policy, as he opposed governmental assumption of such undertakings, and preferred that the project be pushed by private enterprise. In 1898 there was a decided increase in the popular feeling that the government should construct, own, and manage the canal. The unsettled question of the Clayton-Bulwer Treaty is an important one and no sure solution has yet been suggested. Some have claimed that the Treaty is no longer binding on the United States, on the ground that Great Britain violated the treaty in establishing the colony of British Honduras (1862). It has been suggested by some that a "broad" interpretation be placed on the "spirit" of the treaty and that negotiations be entered upon whereby in return for England's relinquishment of the rights of joint control the United States grant the former nation special privileges in the newly acquired Philippines.

It was claimed by the expounders of the canal project that in general a canal across the Central American isthmus would benefit United States commerce in two ways: it would increase the radius of profitable foreign trade and by the reduced rates of transportation would create new trade between points already commercially connected. The following is an outline of the advantages that it is claimed would be gained by the several sections of the United States through the construction of the Nicaragua canal.

The New England and Middle Atlantic States, which constitute the most important manufacturing section of the country, at present receive some of their food supplies and raw material for their mills from the States on the Pacific coast, and from American countries bordering on the Pacific ocean. The construction of the canal would facilitate transportation to the great benefit of consumers and producers in these States. Trade between the east and the States west of the Rockies would be increased, and a profitable Asiatic and Australian commerce, which is now almost wholly in the control of European countries, might be carried on. New York and Boston would be nearer to Yokohama and Melbourne than Liverpool is now by way of the Suez Canal. Thus the benefits of the rapidly developing trade in the Orient would accrue to our eastern manufacturers as well as to those of England and Germany.

The Gulf and the Central Southern States would be benefited in a similar way. Manufacturing here is not nearly so important, but the output for foreign consumption of cotton, cereals, coal, iron, and a number of other products, is far greater. The canal would afford new markets not only for these States, but if we may draw conclusions from present trade tendencies, from the States of almost the entire Mississippi basin. For, with the improvement of the Gulf harbors and the development of trunk railway lines to the south, the manufacturers, farmers, and miners of the middle west have begun to find that transportation southward is as advantageous as eastward over the Appalachian range. These advantages will become more ap-

parent for the western region of the Great Lakes upon the completion of the proposed waterway across Illinois, from Chicago to the Mississippi.

Great as are the benefits just enumerated, it is the Pacific States that are most desirous of the canal. By it these States would obtain at our eastern ports and the ports of Europe a market for their immense mineral and forest resources, and their large amount of fruit and cereal produce.

From the foregoing it is seen that, if the claims for the canal are valid, almost every portion of the United States will be afforded a more advantageous competition with the industrial interests of Europe. Thus far the most important opposition in this country to the canal, from an industrial point of view, has been raised by the trans-continental railways. They maintain that the canal would divert freight traffic from them to a ruinous extent. It would seem, however, that this view is shortsighted and the objection not well taken. For it is thought that the canal would create new traffic rather than divert the old to any considerable extent. It is probable that the lighter freightage—that which is more profitable to long lines of railway—would continue to be transported across the mountains; and the heavier trans-continental freightage is said to be comparatively small. Moreover, the stimulus to traffic afforded by the canal would greatly increase the volume of business for railways on the Pacific slope. Another objection, but one of apparently less importance, was brought by some California merchants who believe that the canal would divert much of the Oriental export trade from the Pacific coast to our Atlantic ports.

From a financial point of view the important question is whether the freight tolls of the canal will cover the interest on the initial outlay and the current expenses. The wide differences in estimates thus far may be seen from the following: "Statisticians representing claims of the trans-continental railroads have estimated the probable tonnage of the Nicaragua Canal Company as low as 300,000 tons a year, while those representing the Maritime Canal Company have estimated it as high as 9,900,000 tons a year—the latter estimate being thirty-three times the former. The important facts throwing light on the question are that the present tonnage of the Panama Railway Company is about 200,000 tons a year, while over 400,000 tons are shipped from our Atlantic ports to the Orient, and over 600,000 tons from our Pacific ports to Europe. But of course by reason of the canal a large increase of traffic will be inevitable. The freight rate by rail from San Francisco to New York is from \$20 to \$30 a ton, and by the Horn from \$10 to \$12 a ton. It is thought that the rate by the canal might be as low as \$5 a ton; on the other hand, it is held by some that the enormous cost of the canal would necessitate such high tolls—from \$3 to \$4 a ton has been estimated by some—that the aggregate cost of transportation would be little less than before.

No small amount of discussion in the latter half of 1898 centered in the Nicaragua Canal from the strategic point of view. The annexation of Hawaii, the war with Spain, necessitating the 13,000 mile voyage of the United States battleship *Oregon* around the Horn, and the subsequent acquisition of the Philippine islands made it clear that merely from the point of view of defensive preparation for war the question of canal construction was most important. And it is safe to say that this argument of national defense has great weight with the authorities at Washington.

NICHOLAS II. See RUSSIA (paragraphs on History).

NICKEL. The production of nickel by American refineries in 1898 from both American and Canadian ores was 6,450,000 lbs., as against 4,099,300 lbs. in 1897, but the average price per pound was \$1.62 less, being 33 cents. The increased consumption of nickel was partly due to the great demand for it in the manufacture of steel for armor plate and other parts of war vessels. Half of the world's market is supplied by the Canadian deposits at Sudbury, Ont. The metallurgy of nickel presents many difficulties, and while some manufacturers have satisfactory processes for its reduction, many others are still looking for such.

NICOLINI, ERNESTO, a well-known tenor and operatic performer, second husband of the prima donna, Adelina Patti, died at Pau, France, Jan. 18, 1898. He was born in Breton, February 1834. He began to be associated with Mme. Patti in various professional engagements soon after her marriage in 1868 to the Marquis de Caux. They made many "starring" tours together, achieving much success—notably in St. Petersburg and Vienna. Finally, after each had obtained legal dissolution of a previous marriage, they were married in 1886 at Craig-y-Nos, Mme. Patti's Welsh residence.

NIGER COAST PROTECTORATE occupies the coast between the German Cameroons on the east and the British colony of Lagos on the west. Treaties dating from 1884 have placed the district under British control, and its boundaries have been defined. The chief products raised are India rubber, ivory, ebony, palm oil, palm kernels, camwood, indigo, barwood, hides and a little cacao, and these too are

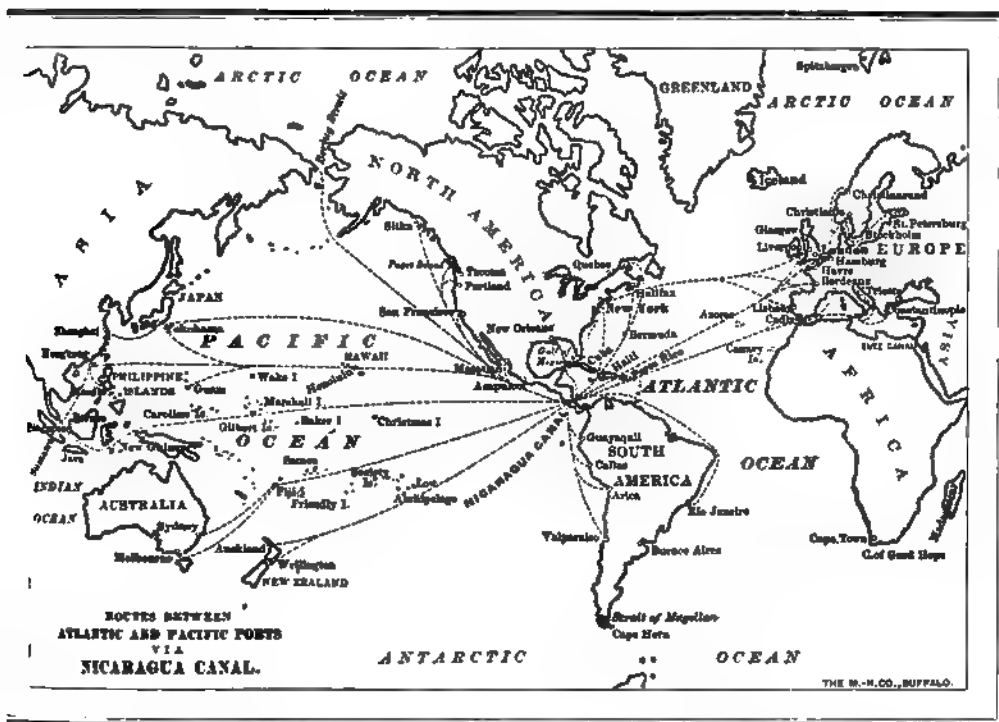


Table of Distances, in Nautical Miles, between Commercial Ports of the World, and Distances Bored by the Nicaragua Canal. Compiled from data furnished by the United States Hydrographic Office. Length of Sailing Routes approximate only.

BETWEEN					BETWEEN				
	Around Cape Horn for Sailing Vessels	Via Magellan for Sailing Vessels	Via Cape of Good Hope	Via Nicaragua Canal		Around Cape Horn for Sailing Vessels	Via Magellan for Sailing Vessels	Via Cape of Good Hope	Via Nicaragua Canal
New York and S. Francisco.	13,400	13,174	4,997	10,753	New Orleans and S. Francisco.	16,000	13,530	4,117	11,853
" " Puget Sound.		13,935	5,965	5,279	" " Acapulco.		11,950	2,285	9,635
" " Sitka.		11,639	6,177	5,385	" " Manzan.		12,402	2,015	9,187
" " Bering Strait.		15,705	7,490	8,303	" " Callao.		10,005	2,994	7,021
" " Acapulco.		11,585	3,043	8,510	" " Valparaiso.		8,400	4,824	4,581
" " Manzan.		13,037	3,673	8,363	Liverpool and San Francisco.	15,620	13,194	7,697	7,993
" " Hong Kong.		13,730	10,083	3,053	" " Acapulco.		11,875	5,765	6,110
" " Yokohama.		15,317	9,227	5,960	" " Manzan.		12,357	6,395	5,960
" " Melbourne.	13,700	13,890	9,863	3,899	" " Auckland.	12,139	11,919	11,192	948
" " Auckland, N. Z.	12,800	11,690	8,463	4,133	" " Guayaquil.		10,639	6,947	4,673
" " Honolulu, S. I.	15,480	13,390	6,417	7,063	" " Callao.		9,990	6,164	3,496
" " Callao.		9,640	3,744	5,896	" " Valparaiso.	9,380	8,790	7,734	1,646
" " Guayaquil.	16,390		3,327	7,673	" " Honolulu.		13,610	9,137	6,673
" " Valparaiso.	2,450	4,440	5,016	4,405	" " Yokohama.		11,505	11,947	2,658
Length of Canal in Nautical Miles.					Western Port of Canal to San Francisco.				
New York to Eastern Port of Canal.				147	" " " Portland.				2,760
Liverpool " " "				2,080	" " " Puget Sound.				3,453
Hamburg " " "				6,127	" " " Valparaiso.				2,007
Bayre " " "				6,081	" " " Callao.				1,637
New Orleans " " "				1,300	" " " Yokohama.				7,000

the principal articles of export. The chief trading centres are Old Calabar, Opobo, Ohumbela, New Calabar, etc. This coast region is very different in character from the lands in the interior, which belong to the Royal Niger Company. The inhabitants of the latter are in a higher rank of civilization and a great part of them have been for many years under Mohammedan rule. In the Niger Coast Protectorate the natives are Pagans, and although the trade is important the resources of the country have not been developed and the work of civilization and economic improvement is not likely to advance rapidly.

NIGER TERRITORIES. The Niger Territories are the most prosperous of all the West African colonies. They are administered by the Royal Niger Company under a charter issued July 10, 1886, and their total area is placed at 500,000 sq. m. with a population variously estimated at from 20,000,000 to 35,000,000. The capital is Asaba, which is the seat of the Chief Justice of the Supreme Court and of a prison, hospitals, and other public buildings. Up to this time the main work of the company has been the maintenance of order and the suppression of slavery, and the trade of the inland country is only beginning to develop. The chief productions are hides, ivory, India rubber, kernels, palm oil, and vegetable butter, all of which are exported to some extent; and there have recently been started plantations of coffee and cocoa. The above estimates of area and population apply only to the territories immediately under the jurisdiction of the Company, but the latter exercises sovereign power over the dependent empire, Sokoto, with an area of 219,500 sq. m. and a population of 15,000,000. This includes the kingdom of Gando in the middle Niger valley, which is a sort of feudal dependency of the sultanate of Sokoto. In this extensive and populous portion of the Soudan the Fulahs are the dominant race. The Sokoto region is bounded on the west by the Borgu and Mossi countries and on the east by Bornu, and northward it extends to the Sahara. The Niger Company has entered into a treaty with Borgu, establishing a similar relation to that which it holds toward Sokoto. The council of the Company in London conducts the government, the President in 1898 being Sir George Taubman-Goldie.

HISTORY.

The Royal Niger Company.—An agreement with France in 1890 separated the French and English spheres on the Niger by a line drawn from Say on that river to Barraua on Lake Tchad, including in the British sphere such territories as fairly belonged to the kingdom of Sokoto. Agreements between England and Germany in 1886 and 1893 defined the respective limits of the German and English spheres of influence. By these agreements with France and Germany a large part of the kingdom of Bornu was comprised within the British territory. The Royal Niger Company has acquired practical control over the lower and middle Niger. It supports its own army and fleet and makes wars and treaties and in other ways exercises sovereign rights. It has been especially strict in repressing the trade in firearms and spirits and its affairs have been very ably administered by Sir Taubman-Goldie, who has done something of the same work for Western Africa that Cecil Rhodes has done for the south. In a paper written in 1898, he points out the great difference between the character of the country on the coast and that of the interior lands administered by the Royal Niger Company. The latter are Soudanese in character, that is to say, they are inhabited by black men under Moslem influence for the Soudan stretches across northern Africa to the western coast, although the term is often limited in its application to the Eastern Soudan. The dominant race are the Fulahs, but among the natives the Hausa type is most conspicuous and the term Hausaland is sometimes applied to this region. The Fulahs are described by Sir Taubman-Goldie as probably of eastern origin, and as having light complexions, regular and fine features, and oval faces when they are of pure breed, but having mingled extensively with the native races many of them have now the physical traits of the negro. They have shown themselves a fearless, warlike race, full of fanaticism and employing cavalry to a large extent in their warfare. But while their military prowess has been remarkable, they seem not to possess the skill and intelligence of the Hausas, or the latter's susceptibility to the influence of civilization.

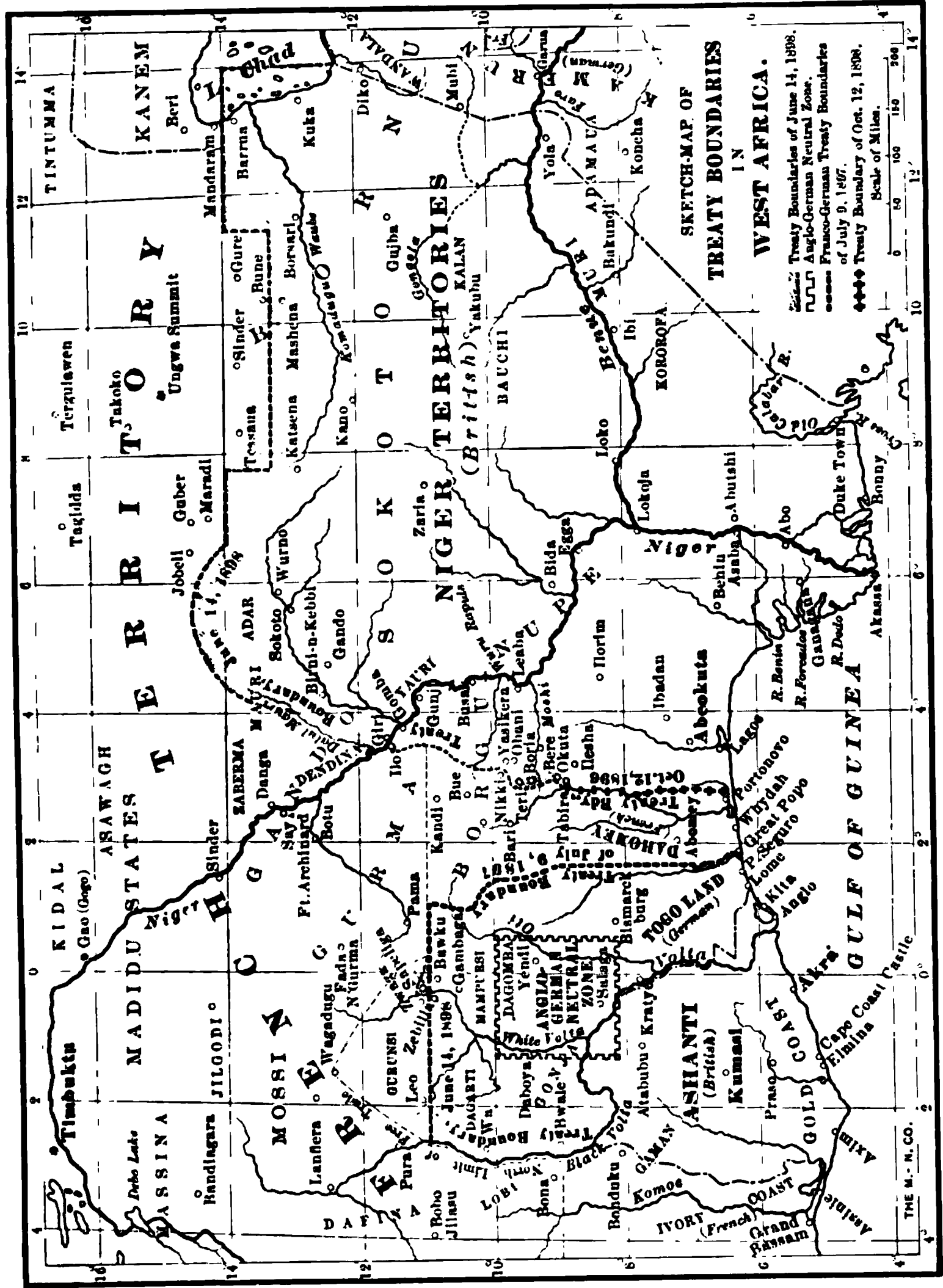
The Royal Niger Company entered on its career as an empire-maker at the time when the government was unwilling to devote any more time or money to the work of African acquisition. "Great Britain is at present," says Sir Taubman-Goldie, writing in 1898, "in a hot fit of empire-making, which, like African fever, has its alternations of cold fits; so lately as 1865 the House of Commons Select Committee appointed to examine into African matters reported as follows: 'That all further extension of territory or assumption of government or new treaties offering any protection to native tribes would be inexpedient.' It was perhaps partly due to this resolution that until the Royal Niger Company stepped in and acquired half a million square miles of the most valuable part of tropical Africa, not a single step was taken into the interior by any of the West African colonies, which allowed another colo-

nizing power to hem them into the sea and deprive them of their hinterland. If a few failures and disasters, such as must occasionally occur in building up an empire, were to happen, we should probably see the same policy revived." The work of the Niger Company has been accomplished without any pecuniary aid from the imperial government. Sir Taubman-Goldie argues in favor of a continuance of the present system. Nigeria, as the Niger Territories are sometimes called, is governed by a council in England, who send out two agents general as their executive officers in the colony. He favors this plan of government from home, but opposes the assumption by imperial government of executive authority. The Niger region has been a bone of contention between the nations. France has been especially active in that region, and by 1898 had secured complete possession of the lands lying between the coast colonies of foreign powers and the course of the Niger. A lieutenant in the French army recently descended the whole length of the Niger, and other expeditions starting respectively from the Soudan and Dahomey, met in the interior after establishing trading posts at important points in the Niger region. In the beginning of 1898 a serious boundary dispute arose with England in regard to the respective limits of French Dahomey and of English Lagos. This was the famous Niger question.

The Niger Question.—A large part of British West Africa is under the control of the Royal Niger Company, whose charter dates from July 10, 1886. The area of the Niger territories previous to the Anglo-French agreement of 1898 was estimated at 500,000 sq. m., comprising a population estimated at from 20,000,000 to 35,000,000. As above stated, the limits of these territories were determined by the Anglo-German and Anglo-French agreements of 1886, 1890 and 1893, comprising all that could be said fairly to belong to the kingdom of Sokoto. The lines separating the British from the German spheres of influence extended from the coast to a point on the southern shore of Lake Tchad, and the boundary between the British and the French spheres of influence extended from the town of Say on the river Niger to Barraua on Lake Tchad. To the west of the Niger lies the important territory of Borgu, to which adjacent lands the French and British laid conflicting claims. In 1897 a British force started from Lokoja to subdue the Fulahs of the interior. This expedition had the sympathy of many of the native chiefs, who complained of Fulah tyranny. It was successful, and the Fulah chiefs were driven northward towards Sokoto. A treaty was signed with the Company, giving them complete control over the country. In June a decree was issued prohibiting slavery in the Company's territories. During this same year reports of French aggressions on alleged British territories were frequent. Nothing definite could be ascertained, but the British public was disturbed by rumors of impending conflicts between British and French troops, and Lord Salisbury in November 1897, declared that the British government would tolerate no interference with their treaty rights in that region. In the fall of 1897 the Anglo-French commission for the delimitation of West Africa began its session in Paris. In the summer of 1898 an agreement on the question of the West African hinterland was announced.

The Anglo-French Agreement.—Neither country obtained all that it claimed. The new boundary line extended northeast from Ilo and a considerable distance to the east of Say, thus surrendering to the French a section of the territory formerly possessed by the English. At the same time the line formed a curve through what had formerly been French territory uniting a considerable tract to the Niger lands. Thus the dispute which seemed to threaten war between the two nations during the winter months of 1897 and the spring of 1898 appeared by midsummer, 1898, to have reached a peaceable solution.

These were the general points in the Anglo-French agreement. The following details, however, are worthy of notice. The disputed territories include two distinct portions; first, the eastern part, where there were conflicting claims to the back country of Lagos and Dahomey; and the western part where the hinterland of the Gold Coast and the Ivory Coast was in dispute. In the eastern section the Royal Niger Company under the energetic administration of Sir George Taubman-Goldie, had been extending its influence in recent years; but French officers had at the same time occupied many posts in territory which undeniably belonged to Great Britain. It may have been that the French seized these posts with the full knowledge that they belonged to Great Britain and with the deliberate intention of taking more than they could rightfully claim in order to seem to be making a graceful concession when the time came for the adjustment of claims. This at least was the suspicion of the English negotiators. Whether it was well grounded or not, the result of the boundary settlement was favorable to France, who received some territory for which no equivalent was rendered to Great Britain. The line of delimitation starts from the accepted boundary between Dahomey and Lagos and crosses the Niger at a point ten miles north of Ilo, including under British jurisdiction all points occupied by the British troops and in general the territory recognized by both powers as belonging to the kingdom of Borgu. The adoption of this line obliges the French to



SKETCH-MAP OF
TREATY BOUNDARIES
IN
WEST AFRICA.

--- Treaty Boundaries of June 14, 1898.
--- Anglo-German Neutral Zone.
--- Franco-German Treaty Boundaries
of July 9, 1907.
--- Treaty Boundary of Oct. 12, 1898.
Scale of Miles.

evacuate those posts, including Bussa and Ilo, which they had seized. But France acquired the station of Nikki and Great Britain abandoned her claim to suzerainty over Gurma. From the Niger, the line extends northeast instead of following the river to Say and thus includes a triangular tract of land with the apex at Say in French territory. As an equivalent for this the line curves beyond the former boundary forming the arc of a circle whose centre is at Sokoto, a segment of territory being thus secured to Great Britain. The northern boundary of the Royal Niger Company's territories, which formerly terminated at Barawa on the shore of Lake Tchad, was prolonged to the middle of the lake, where it meets the prolongation of the Anglo-German boundary on the east.

In the western section of the disputed area, that is in the hinterlands of the Gold Coast and the Ivory Coast, the upper course of the western branch of the river Volta is taken as the prolongation of the boundary between the hinterland of the Gold Coast and the French territory. This ceded to France a strip of land which had theoretically belonged to the Gold Coast hinterland and required the British to evacuate the towns of Dokta and Bona. The eleventh parallel forms the boundary in the interior and leaves to France the important and rich territory of Mossi. For this, it is said, Great Britain has received no equivalent.

As to the fiscal and commercial clauses of the treaty the chief concessions are the granting by Great Britain to France of a thirty years' lease of two bonded areas on the navigable Niger, where French goods may be stored free of duty preparatory to transportation into French territory; and the concession by France for a period of thirty years of free trade to the British in the colonies of France between the Liberian frontier and the Niger.

Each country claimed to have gained the advantage by this treaty. The French foreign office points out that as a result of this convention it can now be said that the French colony of West Africa has a frontier extending over as great a space as from Moscow to Paris. It puts the finishing touch to the treaties made during the last ten years with England, Portugal, Germany, Liberia, and the Congo Free State, and France has acquired beyond dispute the whole region from Algeria to the Congo and from Senegal to the Nile basin. The French also express their satisfaction over the fact that the hinterlands of all their West African colonies are now in communication.

NOBLES OF THE MYSTIC SHRINE, is not a regular Masonic association, although it is composed of Masons who have reached the thirty-third degree, A. A. S. rite (eighteenth degree in England) or of Knights Templars. The membership in the United States is about 50,000 with 79 temples. It is said that this order was instituted by Kalif Ali, cousin of Mohammed, in A. D. 656 as a vigilance committee to dispense justice.

NORDICA, LILIAN (Madame Doehme). Opera singer, born in Maine about 1858. Her real name was Norton. She received her first musical education in the Boston Conservatory and then went to Italy to study. Her first husband was Mr. Gower, who perished in a balloon, and in 1897 she was married to Herr Doehme, a singer. Mme. Nordica stands at the head of American prima donna, and has a large repertoire. Her best parts are Marguerite in *Faust*, Aïda, Donna Anna in *Don Juan*, Brünnhilde, Isolde and Elsa. She has appeared in Bayreuth, and was a member of the Grau Company of 1898-99.

NORTH AMERICA, BOTANY OF. See BOTANY.

NORTH AMERICA, FLORA OF. See BOTANY (paragraphs Systematic Botany—North America—Ecology and Plant Geography).

NORTH CAROLINA, a Southern Atlantic State of the United States, with an area of 52,250 sq. m. Capital, Raleigh.

Mineralogy.—The principal economic productions in 1897 were: gold, \$34,600; silver, \$388; coal, 21,280 short tons, spot value, \$27,000; clay (see Industries); granite, \$59,236; sandstone, \$11,500; and red and brown hematite iron ore. The output of the last was combined with that of Georgia, neither State being reported separately. The total product was 204,639 long tons, value, \$166,704. See MICA.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 34,070,400 bushels, value, \$14,650,272; wheat, 5,274,645, \$4,114,223; oats, 6,338,618, \$2,345,289; rye, 478,578, \$306,290; huckwheat, 31,005, \$14,882; potatoes, 1,080,844, \$670,123; hay, 224,135 tons, \$2,084,456; and cotton (season of 1897-98), 646,726 bales, \$19,098,724—total value, \$43,284,259. Live-stock comprised: horses, 146,697; mules, 111,398; milch cows, 248,263; other cattle, 295,530; sheep, 261,400; and swine, 1,369,703—total head, 2,432,991.

Industries.—In 1898 North Carolina gained second place among the cotton-spinning States in the South, and fifth place among all the States in the number of spindles. There are 220 cotton mills, of which 29 make hosiery and 191 spin or weave or do both. With 24,535 looms and 1,054,686 spindles in operation, the mills consume 163,-

389,000 pounds of cotton annually. During the year new mills put in 43,000 spindles and old ones enlarged their plants by 16,820. No less than 47 per cent. of the mills were run day and night. An interesting feature of this industry in North Carolina is that there is a free school connected with nearly every mill, supported for the most part by the mill owners. The clay-working industries in 1897 had an output valued at \$368,494, of which \$355,324 was represented by brick and tile, from 148 plants. Taxable manufactures yielded the federal government \$3,250,213 in internal revenue in the year ending June 30, 1898. The great tobacco interests had a combined output of 5,765,408 cigars, 825,734,200 cigarettes, 25,311,312 pounds of plug, 111 pounds of fine cut, 4,600,233 pounds of smoking, and 49,272 pounds of snuff. There were 1,452 distilleries of all kinds in operation. The production of distilled spirits, all corn whiskey, was 580,235 gallons, and that of fermented spirits, 80 barrels.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise at the ports of Pamlico and Wilmington aggregated in value \$188,297; exports, \$9,764,599, a decrease in a year of \$32,046 in imports and an increase of \$1,537,353 in exports—total foreign trade, \$9,952,896.

Railroads.—On Jan. 1, 1898, the total length of the various railroads was 3,477.65 miles. In 1897 the new construction was 33.80 miles. The assessed valuation of railroad property was \$29,157,099, an increase in a year of \$2,581,003.

Banks.—On Oct. 31, 1898, there were 27 national banks in operation, and 11 in liquidation. The active capital aggregated \$2,791,000; circulation, \$919,895; deposits, \$5,848,452; reserve, \$1,704,345. The State banks, Sept. 20, 1898, numbered 44, and had capital, \$1,946,060; deposits, \$4,213,420; resources, \$7,074,293; surplus and undivided profits, \$2,216,562; private banks, 21, with capital, \$299,237; deposits, \$886,388; resources, \$1,533,854; surplus and profits, \$378,530; and stock savings banks, 6, with capital, \$280,000; deposits, \$916,367; resources, \$1,918,753.

Education.—The school census of 1896 showed 639,400 persons of school age, of whom 370,920 were enrolled in the public schools, and 231,725 were in daily attendance. The percentage of enrollment by races was: white, 63.79; colored, 59.92. There were 6,603 public school houses; 7,885 teachers; public school property valued at \$1,003,165; expenditures, \$817,562, including \$705,416 for teachers' salaries. For higher education there were 12 public high schools; 132 private secondary schools; 7 public and 9 private normal schools; 16 colleges and universities, co-educational and for men only, with 164 professors and instructors, 2,646 students, and \$176,654 income; 2 technical institutions; 8 colleges for women, with 97 instructors, 905 students, and \$101,896 income; and 5 theological, 2 law, and 3 medical schools. For the promotion of agriculture and the mechanic arts the federal government appropriated \$22,000 for 1897 and \$23,000 for 1898. In the last year there were 254 periodicals, of which 25 were dailies, 195 weeklies, and 28 monthlies.

Finances.—The assessed valuations for 1897 were: real estate, \$153,858,554; personal property, \$75,995,995; railroad property, \$29,157,099—total, \$259,011,508; estimated revenue, \$801,359; legislative appropriations, \$1,023,890. In 1898 the recognized debt comprised \$6,088,150 in funded consols and \$271,920 in unfunded ones, of the total, \$2,745,000 were 6 per cent. consols, the interest on which is paid from the rental of the North Carolina railroad. The State holds \$3,000,000 in the stock of this road, which at market rate is more than sufficient to pay the principal of the 6 per cent. debt. This confines the actual debt to the 4 per cent. consols, of which \$3,368,150 were funded and \$246,920 unfunded.

Population.—As estimated by federal officials, the population on June 30, 1898, was about 1,810,000. Local censuses and estimates gave Charlotte, 19,651; Asheville, 12,832; Durham, 11,200; Salisbury, 7,000.

The Race Troubles.—In 1896 a Populist and Republican combination elected Daniel A. Russell, the Republican candidate, for Governor. This combination, of course, included the black vote, and the negroes to a considerable extent came in for political preferment. As a result of this election the legislature began to enact laws in the political interests of the negroes, and it is these laws which are mainly responsible for the race war in North Carolina. The antagonism between the races was most acute in the eastern counties, and especially in the city of Wilmington, whose white citizens had been practically deprived of their suffrage by a law which authorized the Republican governor to appoint five of the ten members of the board of aldermen. These appointments were given to Republicans, and the remaining members of the board were elected from the five wards, of which two had large negro majorities. Besides this, many magistrates, members of the sanitary boards, and a very large part of the police force as well as other officers in the city were negroes; and in many parts of the State there were negroes in official positions. By the whites the negroes were regarded as thriftless and unworthy citizens, and their domination was viewed with disgust. There was a general resolve on the part of the Democrats throughout the State to overthrow this domination on election day at any cost. It was evident that the feeling in this matter was far deeper than in

regard to the ordinary political issues between the parties. To illustrate how far this whole question was removed from politics it may be noted that the regular Democratic candidates for the legislature, when it was seen that the anti-negro party could not succeed unless they withdrew their names, did so without delay. Unprejudiced persons sympathized with the white Democrats of North Carolina in their resolve to rid themselves of ignorant negro domination, but the methods employed were so violent and revolutionary that in many quarters, especially in the north, the triumph of the whites was unsparingly condemned. In the eastern counties where the struggle was sharpest, the negro population is most dense. When the campaign had started the Democrats announced that they would carry the election by force if necessary, and armed bands of men mounted and conspicuous by wearing red shirts, ranged through the country for the acknowledged purpose of intimidating the negroes. The spirit of the whites is illustrated by a remark of one of the orators of the time who, in describing the way in which people in his own county neutralized the negro domination, said: "When a negro constable comes with a warrant for a white man in his hands, he leaves with a bullet in his brains," and the sentiment met with a cordial response from the audience. The bitter feeling was augmented by the use which the Democrats made of an editorial which appeared on Aug. 18, 1898, in the *Wilmington Record*, a paper edited and published by Alex. M. Manly, a mulatto. Certain passages in this article were regarded by the whites as defamatory of the character of white women. In it the writer referred to a speech made by Mrs. W. H. Felton, of Georgia, at a meeting of an agricultural society, in which she justified a resort to lynching as an extreme measure. The editor, referring to the use which was made of this article afterwards, said that its purport was misconstrued and that he had not intended to slander the white race.

There were no serious disturbances on election day, and the count showed that the whites had swept the State and chosen a legislature that was pledged to the repeal of the objectionable statutes. On the following day began the movement which led to the riots in Wilmington. The details of what occurred are given in the article *Wilmington* (q. v.), and it is necessary here only to mention a few facts which show the relation of the disturbances there to the race problem in the State as a whole. By election day the whole city was under arms and violence was hourly expected. The Democrats had made threatening speeches and had called their ticket the "white man's ticket." There was no trouble on election day, when the Democrats won by a large majority, but in the meanwhile a panic had seized the negroes, who withdrew to the country in large numbers or lay in concealment. On the day after election day a "Committee of Twenty-five" was chosen, which formulated resolutions ordering among other things, that Editor Manly should at once leave the town, and that the negroes should suppress the *Record* within a certain limited time. Then followed the destruction of the *Record* plant and the burning of the building by the whites, the resignation of the mayor, the negro aldermen, and the white Republican and Populist aldermen, the election of new men to take their places, and the swearing in of white special policemen. This was followed by shooting affrays on the streets, in which several negroes were killed and three whites wounded. The justification of this lawlessness is doubtful, but there can be no question about the provocation of the whites nor of the fact that many of those who participated in the riot were people of good standing and character. See the article *WILMINGTON, N. C.*

The greatest intensity of feeling prevailed in the six or seven counties which comprised the "black belt." In the county of Craven, whose port is Newbern, with 12,000 inhabitants, 66 of the local offices were filled by negroes and the State Senator from that county was a negro of bad reputation. One of the chief grounds of complaint was the fact that young white girls seeking for positions in the schools were obliged to apply in person to the negro committee-men for appointment, and to visit these men each month for the certification of their warrants. The negro committee-men, being generally uneducated and often wholly illiterate, were naturally regarded by the whites with contempt and the necessity for white female teachers to depend on their favor sharpened the natural antagonism. Another instance of the seeming injustice of negro rule was cited in the case of the city of Greenville, N. C., where the taxable property amounted to three-fourths of a million dollars, but the aggregate taxes paid by the negro aldermen, who levied the taxes and ordered the expenditures, was \$1.47, and the mayor, who was elected by the negro vote, paid 43 cents in taxes. In view of the fact that out of the revenues of the town over one-half was applied to the salaries of the officers who did not pay taxes, it was natural that the whites should feel considerable irritation. In general the resolve of the whites was that the negro must be disfranchised either by scaring him away from the polls or by forcible resistance when he tried to deposit his ballot. In the "black belt" generally the usual means of terrorizing were employed, and it was in this portion of the State that the "red shirt" brigades were the most active. In the central and northern portions of the State it cannot be denied that the issues were purely political, and that the race question was there employed by politicians for political pur-

poses. The war against the negroes was preached from the stump, in the newspapers, and even from the pulpit in all parts of the State, and the language used was often violent and exaggerated. Many speakers urged the people to win the election by peaceful means if possible, and, if not, to win it at all events.

The saddest part of the affair was the panic that spread among the negroes, and the distress which followed it. Many of them undoubtedly would have willingly sacrificed their political rights as the price of safety. There was an exodus of the negroes from Wilmington, thousands seeking refuge in the woods and spending several days and nights there without food or shelter. So great was their terror on account of the reports of a premeditated slaughter of the negroes by the whites, that it was with the utmost difficulty that they were induced to return to the city.

A writer who seemingly takes an impartial view of the race troubles in North Carolina, notes how narrowly the country escaped from a serious complication in national politics as a result of it. The Democratic rally led to the disintegration of the Republican and Populist parties throughout the State and prevented the negro vote in the "black belt," so that an almost solid Democratic delegation was sent to Congress. Every one will admit that this result was gained by intimidation, and did not represent the free vote of the people. A free election would very probably have given the Congressional delegation to the opposite party. For a time the November elections throughout the Union seemed so close that it was doubtful which party would control the House of Representatives, and the result appeared for the moment to depend upon the election of the North Carolina Congressmen. Fortunately the Republican majorities in other States were sufficient to prevent this, but it might easily have happened that the control of the lower house of Congress would have fallen to the party of opposition as the result of an election in North Carolina carried on by methods open to serious question. This is a specific illustration of the real danger menacing national politics as a result of the race problem in the South.

Elections.—In the Congressional elections, the Democrats effaced the Republican-Populist fusion majority of 1896. Of the nine Representatives elected, seven were Democrats, one was a Republican (colored), and one a Fusionist. The largest Democratic gains were in the east, where negro rule prevailed. Many white Republicans voted the Democratic, or "white man's" ticket, and many Populists turned their backs on the fusion, that their party managers had arranged. In several counties the majority of the negroes stayed away from the polls altogether. In the State legislature the Democrats elected forty members of the Senate and ninety of the House, giving them a majority of 98 on joint ballot.

Constitutional Amendment.—The proposed amendment to the constitution has been opposed by the Legislature, and is to be submitted to a vote of the people at the next general election, the date of which is to be settled by a new election law. With few differences it is a copy of the suffrage clause of the new constitution of Louisiana. It prescribes educational, property and poll-tax qualifications, but, as these would bar many poor and ignorant whites from voting, it further provides that any one may vote, regardless of these qualifications, if he or his ancestors were electors before the adoption of the Fifteenth amendment enfranchising the negroes. A condition for the exercise of this suffrage by inheritance is registration before Dec. 1, 1908. If ratified, the amendment is to go into effect July 1, 1902.

The War Appropriation.—In 1898 North Carolina incurred an expense of \$30,000 in organizing and equipping two regiments of white troops and one regiment of colored men for the war with Spain. About \$900 had been paid and \$683.55 audited and sent to the Treasury Department when the comptroller of the Treasury stopped payment because of an old debt North Carolina owes to the government, on certain Indian trust funds issued in 1856 in aid of the construction of the Western North Carolina railroad. The debt now due the United States is estimated at \$138,340. The matter will be referred to Congress. The State authorities were ignorant of this matter which will be one of the topics of discussion in the coming session of the State legislature.

National Representatives and State Officers.—North Carolina's Representatives are: John H. Smith (Dem.), Elizabeth City; Geo. H. White (Rep.), from Tarboro; Charles R. Thomas (Dem.), from Newbern; John J. Jenkins (Pop.), from Pittsboro; W. W. Kitchin (Dem.), from Roxboro; John D. Bellamy (Dem.), from Wilmington; Theo. F. Klutz (Dem.), from Salisbury; R. Z. Linney (Rep.), from Taylorsville; and W. T. Crawford (Dem.), Wayneville. Senators: Marion Butler (Pop.), from Goldsboro; and Peter C. Pritchard (Rep.), from Marshall. Officials (1899): Governor, Daniel L. Russell (Rep.); Lieutenant-Governor, C. A. Reynolds (Rep.); Secretary, Cyrus Thompson (Pop.); Treasurer, W. H. Worth (Pop.); Auditor, H. W. Ayer (Pop.); Attorney-General, Zeb. Vance Walser (Rep.); Adjutant-General, A. D. Cowles (Rep.); Chief-Justice, William T. Faircloth (Rep.); Associates, Robert M. Douglas (Rep.), Walter Clark (Dem.), D. M. Furches (Rep.), and W. A. Montgomery (Dem.); Clerk, Thomas S. Kenan (Dem.). The State Legislature consists of 134 Democrats and 36 Fusionists.

NORTH DAKOTA, a northwestern State of the United States with an area of 70,795 sq. m. Capital, Bismarck.

Mineralogy.—The principal economic productions in the calendar year 1897 were coal, 77,246 short tons, spot value, \$83,803, from 20 mines; and clay, which 9 plants baked into brick tile worth \$62,420.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 461,852 bushels, value, \$168,267; wheat, 55,654,445, \$28,383,767; oats, 15,060,591, \$3,915,754; barley, 5,252,755, \$1,523,299; rye, 24,480, \$8,813; potatoes, 2,623,572, \$892,014; and hay, 564,777 tons, \$1,835,525—total value, \$36,727,439. The State ranked third in the production of wheat and fifth in barley. Live-stock comprised, horses, 175,137; mules, 7,036; milch cows, 171,073; other cattle, 252,640; sheep, 359,721; and swine, 111,959—total head, 1,077,566.

Railroads.—On Jan. 1, 1898, the length of the various railroads in the State was 2,603.35 miles, of which 36.30 miles were constructed in the previous year. Railroad property was assessed at \$8,772,703, an increase in a year of \$886,673, caused by an addition of \$250 per mile for franchise, hitherto untaxed.

Banks.—On Oct. 31, 1898, there were 24 national banks in operation and 19 in liquidation. The active capital aggregated \$1,500,000; circulation, \$494,181; deposits, \$4,970,118; reserve, \$1,217,516; resources, \$7,743,508. The State and private banks combined numbered (July 14, 1898), 86, and had capital, \$1,142,000; deposits, \$3,736,633; resources, \$5,623,474; surplus and profits, \$1,280,692. In the year ending Sept. 30, 1898, the exchanges at the U. S. clearing house at Fargo aggregated \$13,118,935, an increase of \$6,953,608 in a year.

Education.—In 1896 there were 65,892 persons of school age in the State; in 1897, 72,132. The public school enrollment was 57,088; attendance, 38,478. There were 2,032 public school houses; 3,027 teachers; public school property valued at \$1,926,420; and expenditures, \$1,125,893, including \$586,774 for teachers' salaries. For higher instruction there were 21 public high schools; 3 private secondary schools; a private and 2 public normal schools; 3 colleges and universities, with 27 professors and instructors, 444 students, and \$46,700 income; and a State agricultural college at Fargo, which received from the Federal Government \$22,000 in 1897, and \$23,000 in 1898. In the last year there were 142 periodicals, of which 7 were dailies, 127 weeklies, and 6 monthlies.

Finances.—The assessed valuations in 1897 were: real estate, \$63,778,231; personal property, \$20,920,559; railroad property, \$8,772,703—total, \$93,471,493; tax rate, \$4.30 per \$1,000. The bonded debt, Jan. 1, 1898, was \$845,300; floating debt, \$90,000—total, \$935,300.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 258,000. Local estimates gave Fargo, 8,000; Grand Forks, 7,500; Wahpeton, 2,600.

Elections.—The vote for Governor in 1898 resulted in 7,467 plurality for F. B. Fancher, Republican, over the Fusionist candidate, Holmes. The Republicans were also victorious in the State legislature and in their Congressmen. The result was a surprise, former Populist and Free-Silver strongholds having been carried. In the State legislature the Republicans have a majority of 73 on joint ballot. They elected Porter J. McCumber to succeed William N. Roach (Dem.) in the U. S. Senate.

National Representatives and State Officers.—North Dakota's Representative is B. E. Spalding (Rep.), from Fargo. Senators: H. C. Hansbrough (Rep.), from Devil's Lake, and a Republican. Officials (1899): F. B. Fancher, Governor; J. M. Devine, Lieutenant-Governor; Fred. Falley, Secretary; D. W. Driscoll, Treasurer; A. N. Carlblom, Auditor; J. F. Cowan, Attorney-General; J. G. Holland, Superintendent of Education; Elliot S. Miller, Adjutant-General; H. U. Thomas, Commissioner of Education; G. W. Harrison, Commissioner of Insurance. All are Republicans. Chief-Justice, J. M. Bartholomew; Justices, Alfred Wallin and N. C. Young; Clerk, R. D. Hoskins. All are Republicans. The State Legislature consists of 88 Republicans and 15 Fusionists.

NORTHROP, Rev. BIRDSEY GRANT, LL. D., "the father of village improvement societies," born at Kent, Connecticut, July 16, 1817; died at Clinton, Connecticut, April 27, 1898. It was through his influence that Arbor Day in schools was instituted.

NORTHWAY, STEPHEN A., Republican Member of Congress from Ohio, died September 8, 1898. He was born in Onondaga county, New York, June 19, 1833. When ten years of age he accompanied his parents to Ashtabula county, Ohio; was educated at Kingsville Academy and Orwell Academy, and was admitted to the bar in 1859. Two years later he was elected prosecuting attorney and located in Jefferson. He served two years in the State House of Representatives, beginning with 1865; he was elected to the Fifty-fourth and Fifty-fifth Congresses.

NORTHWEST TERRITORIES, a part of British North America under the Dominion of Canada.

Political Development.—The vast Canadian area, long known as the Northwest Territory and now as the Northwest Territories, is being rapidly brought under the influence of responsible self-government. In 1876, the district of Keewatin was created; in 1882, those of Assiniboia, Saskatchewan, Alberta, and Athabaska; in 1895, those of Ungava, Mackenzie, and Franklin; and in 1898, the region generally known by the name of Yukon, was made a separate Territory. Thus, the Northwest Territories of to-day comprise 9 members, not full-fledged provinces nor yet self-sustaining Territories, but government-aided political divisions, with as much of the dignity of provinces as their present conditions justify. Excepting Ungava and Franklin, whose areas are still unknown, these divisions have a combined water area of 541,545 square miles; land area, 1,987,595—total, 2,529,140. The boundaries of Ungava, Keewatin, Franklin, Mackenzie, and Yukon were changed by an order in council, Dec. 18, 1897.

Industries.—At present the most noteworthy industries are those connected with gold mining in Yukon Territory. There are great possibilities in the lines of agriculture, lumbering, and stock-raising awaiting the opening up of the vast region. Evidences are strong that there is also an immense unexplored petroleum field in this section. Coal mining and various fisheries are carried on with profit, but their returns are incorporated with those of Manitoba (q. v.).

Gold Mining.—For the calendar year 1896 the value of the total output of gold was reported at \$355,000. For 1897, which saw the beginning of the great rush to the Klondike and Yukon fields, the aggregate was \$2,550,000, or more than half of the total reported production of the Northwest Territories since 1885, when the keeping of records was begun. The production for 1898 was estimated in advance and during the season at about \$30,000,000 from the Canadian and American fields together, but during the year there was a marked falling off in the rush to the mines, and at the close of the season it seemed quite certain that the total output on both sides of the Alaskan boundary would not exceed \$20,000,000 and probably would not reach \$15,000,000. William Ogilvie, the surveyor of the Dominion government in Yukon Territory, summarized the results of his explorations and investigations as follows: "I can only speak for the Canadian Yukon district. The gold-bearing country is from 550 to 600 miles in length and from 100 to 150 miles wide. About 100 claims on Bonanza creek alone will yield upwards of \$30,000,000. Bonanza and Eldorado creeks will surely yield from \$60,000,000 to \$75,000,000. While the remainder of the country may not be as rich, yet we may confidently expect from \$200,000,000 to \$300,000,000 to be taken out in the near future." See also COLUMBIA, BRITISH.

Commerce.—The imports of merchandise in the year ending June 30, 1897, amounted in value to \$290,437; duties collected, \$52,425; exports, \$166,889.

Banks.—On June 30, 1897 there were 23 post-office savings banks in operation, which had 985 depositors and \$168,165 deposits. Exchanges were made principally at the clearing house at Winnipeg (see MANITOBA). The service of all banks was largely extended during 1898.

Railways and Post-offices.—In 1897 the total railroad mileage in the four oldest Territories was 1,780. Manitoba and the Northwest Territories together had 790 post-offices, which handled in a year 9,950,000 letters and 1,075,000 postal cards, and 45 money order offices, which issued 40,884 orders.

Education.—Educational matters are under the control of a council of public instruction, consisting of an executive council of 5 members and 5 appointed members without votes. At the end of the school-year 1897, there were 394 public schools in operation, with 470 teachers, and 14,576 enrolled pupils. The government appropriation for the year was \$138,625, and the expenditures included \$173,333 for teachers' salaries. Eight of the schools, with 15 teachers, were classed as separate. Religious instruction in the public schools is allowed only after 3 o'clock in the afternoons, and then only with the approval of the trustees. Parents have the privilege of withdrawing their children at that hour, if they desire. There was one public library, with 2,150 volumes, and (1898) 21 periodicals of all kinds.

Population.—In 1897 the number of Indians in the Territories was 14,373, who cultivated 13,792 acres of land, had 27,161 head of live-stock, and received \$98,063 for their various products. The government maintained 70 schools for Indian youth, which had an enrollment of 2,286 pupils and an average attendance of 1,501. Local estimates in 1898 gave Regina, the capital, 1,600 population; Edmonton and Prince Albert, each 3,000; Macleod, 2,000; Battleford, 1,500; and Moosomin and Qu'Appelle, each 1,000.

NORWAY includes the western portion of the Scandinavian peninsula and is bounded on the east by Sweden and Russia and on every other side is surrounded by water. Though a separate kingdom, it is united politically with Sweden. It has an

area of 124,445 sq. m. with a population of 2,917,000 in 1891. There has been considerable emigration from Norway and the greater part of it has been to the United States. Since 1893, however, the number of Norwegian immigrants to the United States has declined; in that year it was 18,690, while in the year ending June 30, 1898, it was only 4,936. The capital is Christiania with a population of 151,239, and other important towns are Bergen, Trondhjem, Stavanger and Drammen. Agriculture is one of the chief occupations, but although the methods employed in it have improved in recent years the production is not yet adequate for home consumption and Norway is obliged to import a large quantity of bread stuffs from foreign countries. It is estimated that nearly three-fourths of the soil is unproductive, about 22 per cent. being under forest and only 3 per cent. under cultivation. Fish are obtained in the lakes and streams of the interior and in the fjords of the coast. The most important sea fisheries are those of herring, mackerel and cod, which in 1895 gave employment to 136,483 men. An active trade is carried on with foreign countries, especially with Germany, Great Britain, and Sweden. Of these three countries Great Britain formerly stood first in respect to both exports and imports, but the figures for 1896 show that the imports from Germany were in excess of those from Great Britain, although the exports to the latter country still continued to be greater than those to any other country. The other leading countries in respect to trade with Norway are the Netherlands, Denmark, Russia, Spain, France, Belgium and America. The value of the imports in 1896 were 240,217,500 kroner and of the exports 147,771,200 kroner, a considerable increase over the previous year. The krone is valued at 26.8 cents in United States currency. The Norwegian merchant shipping is very important. The number of Norwegian steamships engaged in foreign trade in 1897 was 551 and of sailing vessels 3,234. The revenue, which is derived largely from customs, railways, excise on spirits and malt liquors, etc., was estimated in the budget for the year ending June 30, 1898, at 70,863,331 kroner, balancing the expenditures, in which the State railways constituted the main item. The debt on June 30, 1896, was 157,353,033 kroner. Some recent statistics in regard to the monetary system will be found in the article Money (q. v.). The dominant church is the Lutheran, but all other forms of faith are tolerated. Education is compulsory. The army consists of troops of the line, the militia or *Landvaern* and the final war levy or *Landstorm*. Military service is compulsory upon all men over 22 years of age. The troops of the line number about 30,000 men and 900 officers. The navy consists of 2 iron-clad monitors in process of construction, one corvette, 5 unarmored gun vessels, 28 older gun vessels and a small torpedo flotilla.

Government.—The government of Norway is a constitutional monarchy, the executive power being vested in the King of Norway and Sweden and the legislative power in the Storting, consisting of Representatives of the people. The constitution dates from 1814, but has undergone several modifications. The King has a limited veto power, his veto holds until the same measure passes three separate Storthings. He is Commander-in-Chief of the army and navy and has the appointing power, but for the most part is not allowed to appoint other than Norwegians to office. The Storting is elected every three years, the electorate consisting of all Norwegian citizens 25 years of age who have certain property qualifications or pay a certain amount in taxes, or have served as public officials. The King exercises his authority through a Council of State at Christiania, the official connection between this body and the court being maintained by a delegation of two of the councillors and one of the ministers, who reside at Stockholm.

The Constitutional Question.—The constitutional difficulty between Norway and Sweden which has occasioned much political strife in recent years arises from the demand on the part of Norway for greater independence in the foreign affairs. The Liberal party of Norway, under the lead of M. Steen, has been especially urgent in pressing this demand. In 1892 the Storting passed a measure for the establishment of a separate consulate for Norway, but this did not receive the sanction of the King. The Conservatives came into power shortly after this, but the elections of 1894 gave the Liberals again the majority. In October 1897, the general election resulted in further gains for the Liberal or Radical party and sharpened the conflict with Sweden over the representation of Norway in foreign affairs. In 1895 a Swedish and Norwegian commission had been appointed to arrange a satisfactory basis for an agreement between Norway and Sweden on the points at issue. In 1898 the difficulty was still far from adjustment. The aim of the Norwegians was to secure a separate foreign ministry with separate diplomatic and consular service. On March 7, 1898, the Swedish and Norwegian members of the commission submitted their reports. The Swedish recommendation was that a common foreign minister, who might be either a Swede or a Norwegian, but who was not to be a member of either the Riksdag or the Storting, should be appointed, and he should reside at Stockholm. The Norwegian members recommended that each country should contribute to the expense of the foreign ministry in proportion to its population and that while a common consular representation should continue to exist for

fifteen years, each country should be entitled to demand a separate consulate after that time. The minority report of the Norwegians recommends separation throughout the entire foreign administration. The reports of this Scandinavian conflict received in foreign countries gave an erroneous impression of the relations of the two States. It was commonly said that Norway was groaning under the oppression of her neighbor, being in a sort of vassalage to Sweden; that the effect of the union was to restrict the development of Norway's foreign commerce, to hamper her domestic trade resources, and in general to block her progress. As a matter of fact, however, Norway is not in the condition which these reports have implied. Her internal affairs have been prosperous; her credit is sound, the price of land is on the increase, and the laboring classes seem to be in good condition. In fine, the last few years have been a period of great prosperity. Owing to this very fact, however, the country feels the humiliation arising from Swedish control of foreign affairs—a control which has been exercised since the change in the Swedish constitution in 1885. An ambitious and advancing country naturally resents what seems to be a denial to it of an attribute of sovereignty. The grounds on which Norway demanded a separate foreign minister and a separate diplomatic and consular service were that the existing arrangement caused her serious financial loss, at the same time that it gave her a humiliating sense of inferiority. Sweden on the other hand retorted that such a double representation would lead to confusion in the relations of Sweden and Norway with foreign countries, for if the king sent two ministers to represent his government in each country and these two ministers disagreed, as they probably would, the diplomatic situation would be embarrassing. To this the Norwegians rejoined that Sweden and Norway should become neutral States and in that event the ministers would be merely commercial agents. Again the Norwegians urged that if Sweden was opposed to such an arrangement she should adopt the alternative of an alliance rather than a union between the two countries, permitting Norway to have her own king.

History, 1898.—A radical ministry headed by Steen took the place of the Hagenup ministry on February 17. The constitutional question continued to absorb the attention of parties without prospect of immediate settlement. A vote of the Storting on April 21, declared in favor of universal suffrage. This was one of the reforms aimed at by the Liberal or Radical party. It extended suffrage to all self-supporting citizens 25 years of age or over. The law of 1885 had widened the suffrage to some extent and since 1894 it has been an important political issue. The measure was opposed by the conservative element in the population and especially by a large number of the farmers. This opposition was sufficient to prevent the Liberals from obtaining a large majority in the election of 1894, but the next triennial election, that of 1897, gave them a two-thirds majority. After the Czar's peace proposal was made public, it was suggested by the Norwegian government in October that steps should be taken by European powers toward recognizing Sweden and Norway as neutral States. In the same month it was announced that a revision of the commercial treaties between Russia on the one hand and Sweden and Norway on the other had been proposed by the former power, and that the Norwegian government had expressed its willingness to conclude a separate treaty with Russia. On November 11, 1898, the Storting passed a resolution for the introduction of a separate Norwegian flag. See the article SWEDEN.

NOVA SCOTIA, a province of the Dominion of Canada, has an area of 20,600 sq. m. Capital, Halifax.

Mineralogy.—In the year ending Sept. 30, 1897, the output of coal was 2,465,387 short tons, value \$3,852,168, and the exports aggregated 384,138 tons. At the end of the year this industry received a great boom through the signing of a contract for the delivery of 800,000 tons annually in Boston for a term of 20 years, the purchasing corporation having the right to call for 1,500,000 tons at the same figure. This contract will double the output of the mines for at least the time specified. Gold mining had an output worth \$562,165, and iron ore (1896) one of 58,810 tons, out of a total in all the provinces of 91,906 tons. Of a total of 207,032 tons of gypsum in all the provinces, Nova Scotia had a product of 136,590 tons, value \$111,251.

Fisheries.—In the calendar year 1896 the value of all fishery products was \$6,070,895; principal catches, cod, \$2,157,315; lobsters, \$1,322,905; herring, \$709,008; mackerel, \$468,584; and haddock, 367,196. The value of all apparatus employed in the industry was \$3,069,753; exports of fishery products (1897), \$4,568,157.

Commerce.—The imports of merchandise in the year ending June 30, 1897, aggregated in value \$7,657,242; duties collected, \$1,611,659; exports, \$11,312,090. The registered sea-going tonnage carrying cargoes into and out of the province averaged for the year 2,549,653, and the tonnage of all vessels, British and foreign, employed in the coasting trade, which arrived at and departed from local ports, was 4,855,610. To facilitate navigation there were 171 lighthouses, 2 fog alarms, and one lightship, with a total of 182 lights.

Banks.—On June 30, 1897, there were 52 post-office savings banks, with 12,534 depositors and \$3,399,209 deposits, and 18 governmental savings banks, with 17,311 depositors and \$5,682,338 deposits. Exchanges at the clearing house at Halifax during the year then ended aggregated \$63,736,000. Loan companies and building societies had combined paid in capital, \$150,500; deposits, \$166,607; loans, \$1,256,777; and assets, \$1,347,931.

Railways and Post-offices.—The railways, June 30, 1897, had a total length of 958 miles, of which 28 miles belonged to iron and coal companies. Public lines had been aided with \$2,280,116 in government bonus and \$261,685 in municipal. There were 1,657 post-offices which handled in a year 9,100,000 letters and 1,725,000 postal cards, and 174 money-order offices, which issued 118,035 money orders.

Education.—The public schools, July 31, 1897, numbered 2,346, and had 100,847 enrolled pupils with average daily attendance of 51,316; county academies had 1,685 pupils and 58 teachers; and normal and model schools, 277 pupils and 9 teachers. The receipts and expenditures balanced at \$810,676; the former comprising \$242,811 from the government grant, \$119,602 from municipal appropriations, and \$448,263 from other sources; and the latter including \$182,464 for teachers' salaries. The Victoria School of Art at Halifax had 127 students. Other schools numbered 21, and had 1,962 pupils and 67 teachers. There were 26 public libraries with a total of 97,521 volumes, and 73 periodicals of all kinds.

Finances.—In the year ending Sept. 30, 1897, the revenue was \$832,240; expenditure, \$853,699; gross debt on that date, \$3,617,138; assets, \$1,313,205, including the Dominion government debt allowance, \$1,056,179; net debt, \$2,303,923. The government subsidy to the province was \$432,809.

Population.—The Indian population in 1897 was 1,890, who cultivated 3,056 acres of land, and received \$20,629 for their various products. Eight schools were maintained for Indian youth, which had 138 pupils. The parliamentary grant for the Indians in the province was \$8,045.

NUMISMATIC AND ARCHÆOLOGICAL SOCIETY, AMERICAN, founded in 1858, has 250 members. President, Andrew C. Zabriskie; Secretary, George F. Kunz, New York.

In 1898, 425 medals were added to its collection, four pelts or beaver skins issued in 1857 by the Indians of Northwest Canada as a kind of currency were donated by Daniel Parish, who also gave rare coins. Officers elected at the 41st annual meeting in New York are: Andrew C. Zabriskie, President; H. Russell Drawne and Woodbury G. Langdon, Vice-Presidents; Charles Pryer, Treasurer; Bauman L. Belden, Secretary; and Edward Groh, Curator.

NURSES, TRAINED. The number of those who have entered the profession of nursing has increased rapidly during the past ten years. In the large cities of the East, notably New York and Philadelphia, there is a supply of trained nurses which exceeds the demand, except in midsummer and during the prevalence of epidemics. In the South and Southwest there is a demand for nurses, especially for those trained in the two great medical centres, New York and Philadelphia. In some Southern cities the fees paid are double those paid in the North or East for the same service. Those desirous of becoming trained nurses naturally seek training in a large city, where instruction is sure to be thorough, and the variety of diseases seen is large, and where they may enjoy the probability of immediate employment after leaving the training school.

The course of study and training in the schools in some small towns is a year, in others 18 months. In New York and Philadelphia the course extends, in a few schools, over 2 years' time, in most over 3 years' time. Applicants receive from the Superintendent of a training school a blank containing printed instructions respecting the character of information to be given by the enquirer. Most hospitals in the cities named require a brief personal history, with the names and addresses of two responsible persons to whom the applicant has been known for a number of years, together with a statement from a physician that the applicant is in sound health and possessed of unimpaired faculties. A thorough English education is essential, and the preference is given to persons of superior education and cultivation. Candidates must be between 21 and 35 years of age, of average height and weight, and of strong physique. If approved, the applicant is received into the school for a period of two months, on probation. During this period applicants receive their board and lodging at the training school, without charge and serve without remuneration, and their education, physical strength, endurance, adaptability, powers of observation and judgment are tested. Should they prove acceptable, they are required to sign an agreement for the remainder of the term of three (or two) years, to obey regulations and to remain in the school till the term has ended. In the case of women, the unmarried or widowed are preferred or are the only ones received. A pupil may be dropped at any time for misconduct, inefficiency or neglect of duty, or for failure to pass examinations. Pupils reside in the hospital, and assist in various departments. They

wear a uniform when on duty. There is no charge made for instruction. The pupils receive board, lodging and laundering of clothing and a certain amount of money for the purchase of text books and uniforms and for incidental expenses. In the Pennsylvania Hospital, a nurse receives \$10 a month for the first year, \$12 a month for the second year, and \$14 a month for the third year; in Bellevue Hospital Training School, New York, \$7 a month the first year, and \$12 a month the second year; in Presbyterian Hospital the Training School, \$8 a month for 34 months; in the New York Hospital Training School, the monthly allowance is \$10 the first year, \$13 the second year and \$16 the third year; in St. Luke's Hospital Training School, New York City, the monthly allowance is \$10 during the three years; in Mt. Sinai Hospital Training School the monthly allowance is \$7 the first year and \$12 the second year. The hours of duty are generally from 7 A. M. to 7 P. M., or 7 P. M. to 7 A. M., leisure time amounting to about two hours daily, one afternoon a week (from 2 to 7 P. M.) and about four hours each Sunday, subject to the exigencies of the service. In case of sickness, nurses are cared for gratuitously, but must make up lost time. The instruction is given by the physicians and surgeons of visiting and resident staffs, by the Superintendent and by the head nurses, and covers all departments of nursing, including cooking proper food and delicacies, and frequently massage, obstetrics and the care of insane and alcoholics. In some institutions, there is a regulation under which nurses are sent out to nurse in families before completing their course of study, as a test of fitness. Upon the completion of the course, a diploma is given each nurse. Some institutions require a nurse to make an annual report to the Superintendent, after graduating. Following are the numbers of graduates in 1898 of some of the training schools mentioned, together with the names of the Superintendents: Pennsylvania Hospital, Philadelphia, 8 graduates; Lucy Walker, Superintendent. Mt. Sinai Hospital, New York City, 17 graduates; Mrs. Marion F. Dean, Superintendent. Presbyterian Hospital, New York City, 19 graduates; Anna C. Maxwell, Superintendent. Bellevue Hospital, 31 graduates; Agnes S. Brennan, Superintendent.

OATS. The following table published by the Department of Agriculture shows the acreage, production and value of oats in the United States in 1898:

States and Territories.	Area. Acres.	Production. Bushels.	Value.
Maine	140,217	5,047,812	\$1,716.256
New Hampshire.....	30,538	1,007,754	382.947
Vermont	108,090	4,107,420	1,437.597
Massachusetts	15,121	483,872	179.033
Rhode Island	3,653	98,631	36.493
Connecticut	19,949	562,562	202.522
New York.....	1,408,238	38,726,545	12,005.229
New Jersey	98,137	1,923,485	596.280
Pennsylvania	1,163,043	27,098,902	8,129.671
Delaware	17,587	386,914	116.074
Maryland	78,335	1,527,532	442.984
Virginia	427,369	6,880,641	1,995.386
North Carolina	443,260	6,338,618	2,345.289
South Carolina	244,658	4,208,118	1,893.653
Georgia	433,521	7,196,449	3,454.296
Florida	40,461	623,099	336.473
Alabama	320,433	5,383,274	2,207.142
Mississippi	130,070	2,406,295	1,010.644
Louisiana	36,593	662,333	251.687
Texas	711,166	21,121,630	5,914.056
Arkansas	317,089	7,229,629	2,096.592
Tennessee	361,232	6,755,038	1,891.411
West Virginia	149,265	2,910,668	873.200
Kentucky	422,592	9,466,061	2,555.836
Ohio	897,222	27,724,160	6,653.708
Michigan	847,032	27,782,650	7,501.316
Indiana	1,093,790	31,938,668	7,345.894
Illinois	3,044,951	88,303,579	20,309.823
Wisconsin	1,790,671	64,643,223	15,514.374
Minnesota	1,550,925	56,298,578	11,822.701
Iowa	3,630,239	123,428,126	29,622.750
Missouri	933,304	15,866,168	3,649.219
Kansas	1,482,735	26,689,248	5,871.635
Nebraska	1,752,182	56,245,042	11,249.008
South Dakota	601,738	16,126,578	3,386.581

States and Territories.	Area. Acres.	Production. Bushels.	Value.
North Dakota	490,573	15,060,591	3,915,754
Montana	61,047	2,478,508	867,478
Wyoming	13,282	414,398	165,759
Colorado	85,564	3,063,191	1,255,908
New Mexico	6,998	271,522	111,324
Arizona .....	.....	.....	.....
Utah	24,432	969,950	368,581
Nevada .....	.....	.....	.....
Idaho	29,411	1,282,320	461,635
Washington	78,043	3,270,002	1,308,001
Oregon	183,465	4,953,555	1,981,422
California	58,888	1,943,304	971,652
Oklahoma .....	.....	.....	.....
Indian Territory .....	.....	.....	.....
Total	25,777,110	730,906,643	\$186,405,364

OCEAN RECORDS in 1898. The *Kaiser Wilhelm der Grosse* of the North German Lloyd holds the record for the fastest trans-Atlantic voyage. The accompanying table is her record for the year:

Date.	WESTWARD.			Distance. Knots.	Average Speed. Knots.
	d.	h.	m.		
March	5	23	37	3,100	21.59
March 30	5	20	0	3,120	22.29
April 27.....	6	3	57	3,115	21.06
May 25.....	5	21	48	3,130	22.07
June 24.....	6	2	13	3,123	21.36
August 3.....	6	2	10	3,050	20.87
September 28.....	6	2	38	3,052	20.81
November 2.....	6	5	27	3,050	20.41
EASTWARD.					
March 16.....	5	19	30	3,027	21.77
April 12.....	5	23	2	3,035	21.22
May 10.....	5	16	48	3,035	22.19
June 7.....	6	19	20	3,190	19.53
July 5.....	5	19	45	3,146	22.51
August 16.....	5	23	30	3,075	21.43
October 11.....	6	6	27	3,080	20.47
November 15.....	5	20	20	3,077	21.92

OCEANS. Dr. John Murray in an article on Ocean Temperatures in the August *Geographical Journal* shows that the greatest annual range, exceeding 50° Fahr. occurs over a small portion of the Japan Sea, and over a larger portion of the Atlantic Ocean east of Cape Cod. The lowest of all surface temperatures is 26° Fahr. and is in the Atlantic Ocean east of Nova Scotia, while the highest is 90° Fahr. in the tropical Pacific, and 96° Fahr. in the Red Sea and Persian Gulf, whence the greatest general range of Ocean temperature for the whole world is 70° Fahr.

OCHEERS include ocher, umber and sienna. According to the U. S. Geological Survey report, the States producing ochers in 1897 were Alabama, California, Georgia, Iowa, Kansas, Maryland, Missouri, New York, Pennsylvania, Vermont, and Virginia. Pennsylvania produced nearly one-half of the entire output. UMBER and sienna were produced by New York, Pennsylvania, and Missouri, Pennsylvania producing nearly nine-tenths of the former and more than one-half of the latter. The output in 1897 was:

	Short tons.	Value.
Ocher	14,006	\$162,764
Uंबर	1,080	\$11,710
Sienna	620	\$10,610
	15,706	\$185,084

ODD FELLOWS. See INDEPENDENT ORDER OF ODD FELLOWS.
OHIO, an east central State of the United States with an area of 41,060 sq. m. Capital, Columbus.

Mineralogy.—The miners' strike in 1897 caused a considerable reduction in the year's output of coal. Of 350 mines in operation during a portion of the year, strikes occurred in 228, affecting 21,685 operators. The total product was 12,196,942 short tons; spot value, \$9,535,409. Mining machines aggregating 224 were used by 39 corporations, and 3,843,345 short tons were mined by this means. (See COAL.) The State ranked first in the production of carbonate iron ore, with an output of 54,417 long tons, value \$64,235. Quarrying yielded \$3,086,608, of which \$1,600,058 was in sandstone and \$1,486,550 in limestone. Petroleum showed a decrease in a year of 2,380,654 barrels in a total output of 21,560,515 barrels, value \$11,232,998. The approximate value of the natural gas yield was \$1,171,777, a slight decrease in a year. There were 11 saltworks of all kinds, which had a combined product of 1,575,414 barrels, value \$421,757, a decrease in production and slight increase in value. For the clay, cement, and coke industries, see succeeding paragraph on Manufactures.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 102,828,439 bushels, value \$27,763,679; wheat, 42,103,173, \$27,788,094; oats, 27,724,160, \$6,653,798; barley, 624,742, \$274,886; rye, 756,326, \$340,347; buckwheat, 198,220, \$101,092; potatoes, 10,404,892, \$4,266,006; and hay, 2,453,136 tons, \$14,105,532—total value, \$81,293,434. The State ranked fourth in the production of wheat, eighth in corn, and ninth in oats. Live-stock comprised, horses, 653,499; mules, 17,228; milch cows, 736,735; other cattle, 636,433; sheep, 2,730,471; and swine, 2,307,051—total head, 7,081,417. The State ranked third in the number of sheep and fourth in swine.

Manufactures.—In 1897 there were 1,035 clay-working plants, which had an output valued at \$10,617,684. Of this total, \$5,897,415 represented the production of various grades of brick and tile, and \$4,720,269 that of pottery. In the value of clay products Ohio held first rank among the States. Cement was produced by 4 works to the amount of 146,452 barrels, value \$256,291. One plant was destroyed by fire, but was speedily rebuilt; one enlarged its capacity, and a new one near Sandusky was built. For caking there were 9 plants in operation; product, 95,087 short tons; value, \$235,784. The taxable manufactures of the State yielded the Federal government \$16,436,908 in internal revenue, in the fiscal year ending June 30, 1898. Manufactures of tobacco were: cigars, 491,680,672; cigarettes, 3,488,690; plug, 11,260,915 pounds; fine cut, 259,438; smoking, 6,532,379; and snuff, 9,445. There were 59 distilleries of all kinds in operation. The production of distilled spirits was 9,318,263 gallons, principally the various brands of whiskey; production of fermented liquors, 2,886,830 barrels.

Commerce.—In the year ending June 30, 1898, the imports of merchandise at the various ports aggregated in value \$2,103,462; exports, \$3,068,190, a decrease in imports and an increase in exports; total foreign trade, \$5,171,652.

Railroads.—Ohio ranked fourth among the States in railroad mileage on Jan. 1, 1898, the total length of roads being reported at 8,766.79 miles. There was a slight increase in the previous year and an aggregate of 786.30 miles since 1890.

Banks.—On Oct. 31, 1898, there were 254 national banks in operation and 107 in liquidation. The active capital aggregated \$45,040,000; circulation, \$19,086,868; deposits, \$135,751,954; reserve, \$44,545,271; resources, \$214,812,295. The State banks, Oct. 4, 1897, numbered 144, and had capital, \$12,702,100; deposits, \$50,426,657; resources, \$67,942,202; surplus and profits, \$3,559,713; private banks, 55, with capital, \$1,031,567; deposits, \$5,049,740; resources, \$6,521,215; and mutual savings banks, 4, with depositors, 70,178; deposits, \$28,364,105; resources, \$31,011,044. There were also 5 stock savings banks, which had, June 30, 1898, capital, \$1,151,000; depositors, 14,465; deposits, \$9,040,236; resources, \$11,703,293. The exchanges at the U. S. clearing houses at Cincinnati, Cleveland, Columbus, Canton, Springfield, Toledo, Fremont, and Akron, in the year ending Sept. 30, 1898, aggregated \$1,355,761,912, an increase of \$148,214,103 in a year.

Education.—At the end of the school-year 1896-7 there were 1,173,237 persons of school age in the State, of whom 825,650 were enrolled in the public schools, and 607,304 were in daily attendance. There were 13,091 public school houses, 25,216 teachers, public school property valued at \$40,043,312; and expenditures, \$12,574,390, including \$8,430,875 for teachers' salaries. The institutions for higher education included 584 public high schools; 58 private secondary schools; 6 public and 13 private normal schools; 35 colleges and universities, co-educational and for men only, with 667 professors and instructors, 9,097 students, and \$988,151 income; 6 colleges for women, with 103 instructors, 520 students, and \$98,660 income; a school of technology; and 13 theological, 6 law, and 15 medical schools. The receipts of the school fund in the year ending Nov. 15, 1897, were \$1,743,775; expenditures, \$1,759,687; receipts of university fund, \$239,898; expenditures, \$193,618; and aggregate debts of special school districts, \$7,030,159.

Libraries.—The last report of public libraries (1896) credited the State with 202 of 1,000 volumes each and upward, with a total of 1,587,891 bound volumes and 205,754 pamphlets. In 1897 the institutions for higher education had a total of 531,-

585 bound volumes in their libraries. At the close of 1898 there were 1,192 periodicals, of which 163 were dailies, 811 weeklies, and 146 monthlies.

Finances.—On Nov. 15, 1897, the funded State debt was \$1,291,665; irreducible State debt (more properly, trust fund), for the benefit of the public schools, \$4,649,609—total, \$5,941,274. The debts of counties, first and second class cities, incorporated villages, townships, and special school districts, aggregated \$94,727,256. The assessed valuations for 1897 were, real estate, \$1,236,911,871; personal property, \$511,096,768—total, \$1,748,008,639; tax rate for 1898, \$2.84 per \$1,000.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 4,335,000. Local estimates gave Cleveland, 402,000; Cincinnati, 400,000; Toledo, 145,000; Columbus, 135,000; Dayton, 85,000; Springfield, 41,000; Zanesville, 25,000; Chillicothe, 16,000; Ashtabula, 14,000; Lorain 12,000.

Senatorial Contest.—The year 1898 opened with State politics in a ferment. On Jan. 12 one of the most remarkable and bitter contests in the history of the State was brought to a conclusion. The Hon. Marcus A. Hanna was elected U. S. Senator to succeed himself both for the short term ending March 4, 1899, and for the long term ending March 4, 1905. The final vote was Hanna, 73; McKisson, 70; Lentz, 1; absent, 1.

Elections.—The Republican convention held in June congratulated the country on the re-establishment of protection and reciprocity by the enactment of the Dingley bill. It also declared "the civil service law was extended by the last Democratic administration far beyond its purpose and intent and we favor such modification thereof and such revocation of orders as will conform it to the original spirit and object of the law." The convention also approved of the annexation of Hawaii.

Generally speaking the Republicans have lost in Ohio in the elections of the "off years," but this party carried the State elections. President McKinley is the first Republican President to get the endorsement of this State in the odd year. This is supposed to be due to the sentiment inspired by the war, and the fact that President McKinley is from Ohio, doubtless, had something to do with it. The Democrats endeavored to arrange a new plan of party organization, and the most decisive feature of the convention was its favoring Bryan's nomination in 1900 on the platform of 1896.

Legislation.—The legislature appropriated \$1,000,000 for the defence of the State and support of the federal government in the war with Spain. Laws were passed authorizing the use of voting machines; making it the duty of adult children to support indigent parents; and authorizing the appointment of commissioners to examine the subjects of marriage, divorce, negotiable instruments, wills, notarial certificates, and acknowledgments of instruments, with a view to uniformity of legislation in the United States. An act was also passed defining and prohibiting trusts, providing severe penalties and forfeitures for the violation of the law. It provides that in prosecutions the character of the trust or combination may be established by proof of its general reputation as such. Another act provides that the Court of Common Pleas and Superior Courts, in any county containing a city of the first or second grade of the first class, should be authorized to try all questions of law and fact arising in civil cases. Furthermore, a jury is to be deemed waived in all cases unless a trial by jury is demanded by notice in writing at least five days before the first day of the term after the issue should be made up, and a deposit of \$5 must be made on giving notice. A pauper is entitled to a trial by jury without the deposit, if he makes affidavit. The court may also send a case to a jury of its own motion. Changes were also made in the marriage law. The license must state under oath the name, age, residence, birthplace, and occupation of the parties, and the name of the father and maiden name of the mother of each of the parties if known, and how often either has previously been married, and the married name of the bride if a widow or divorced woman, and the name of the person expected to solemnize the marriage. The act authorizing the Humane Society of Cincinnati to collect a license of \$2 each on all dogs was declared unconstitutional by Judge Smith in the Court of Common Pleas, on March 8.

Ohio is one of the four States that have always denied the Executive all participation in legislation, the other three being North Carolina, Rhode Island, and Delaware. The Governor's lack of veto power is to be remedied. A joint resolution provides for the submission of a constitutional amendment to the popular vote at the election in 1899. In 1898 Ohio permitted the use of voting machines, the localities having the right to choose by popular vote any kind of machine approved by a State commission of ex-officio members. Another important feature of this legislation was the authorization of the Governor to appoint a special commission to suggest a uniform municipal code for the State. In regard to this measure the hope was expressed that it would "result in doing away to some extent with the confusion, anomaly, often absurdity of the Ohio laws governing cities."

In Ohio during the past year, county commissioners have been authorized to levy a license tax of \$1 a year on bicycles, and construct and maintain bicycle paths with the proceeds. A law has also been passed requiring that, in sprinkling streets in cities of the first class, a dry strip three feet wide shall be left in which bicyclists shall have the right of way.

National Representatives and State Officers.—Ohio's 21 Representatives are: W. B. Shattuc (Rep.), from Cincinnati; J. H. Bromwell (Rep.), from Cincinnati; John L. Brenner (Dem.), from Dayton; R. B. Gordon (Dem.), from St. Mary; Davis Meekison (Dem.), from Napoleon; Seth W. Brown (Rep.), from Lebanon; Walter I. Weaver (Rep.), from Springfield; Archibald Lybrand (Rep.), from Delaware; James H. Southard (Rep.), from Toledo; Stephen R. Morgan (Rep.), from Oak Hill; Charles H. Grosvenor (Rep.), from Athens; John J. Lentz (Dem.), from Columbus; Jas. A. Norton (Dem.), from Tiffin; Winfield S. Kerr (Rep.), from Mansfield; Henry C. Van Voorhis (Rep.), from Zanesville; Lorenzo Danford (Rep.), from St. Clairsville; John A. McDowell (Dem.), from Millersburg; Robert W. Taylor (Rep.), from Lisbon; Charles Dick (Rep.), from Akron; F. O. Phillips (Rep.), from Medina; and Theo. E. Burton (Rep.), from Cleveland. Senators: Marcus A. Hanna (Rep.), from Cleveland, and Joseph B. Foraker (Rep.), from Cincinnati. Officials (1889): A. S. Bushnell, Governor; A. W. Jones, Lieutenant-Governor; Charles Kinney, Secretary; S. B. Campbell, Treasurer; W. D. Guilbert, Auditor; Lewis D. Bonebrake, Commissioner of Common Schools; F. S. Monnett, Attorney-General; H. A. Kingsley, Adjutant-General; W. W. Miller, Secretary of Agriculture; W. S. Matthews, Commissioner of Insurance. Chief Justice, William T. Spear; Associates, John A. Shauck, T. A. Minshall, Joseph P. Bradbury, Marshall J. Williams, and Jacob F. Burket; Clerk, Josiah B. Allen. All are Republicans. The State legislature consists of 79 Republicans, 1 Independent Republican, and 65 Democrats.

OKLAHOMA, a Territory of the United States, has an area of 39,030 sq. m. Capital, Guthrie.

Mineralogy.—In 1898 there were indications of valuable mineral deposits in various parts of the Territory, but there had been little done toward developing them. There is no doubt of the existence of coal in commercial quantities, especially in Pawnee, Payne, Lincoln, Logan and Pottawatomie counties, in the Kiowa and Comanche reservation, and along the Creek reservation line. Mining has already been begun at Ralston. Immense cement deposits are being utilized by works at Okarcue and Newkirk. Blaine county is full of gypsum. In the saline reserves thousands of tons of almost pure salt are in sight on top of the ground, and elsewhere are numerous deposits of rock salt at a depth easily reached. Oil and natural gas are found in adjoining parts of the Indian Territory and Kansas; the latter is known, and the former believed to exist here also.

Agriculture.—The great majority of the people are engaged in agriculture and stock-growing. In 1897 the yield of wheat was about 20,000,000 bushels. Corn is also a large crop, but the greater part of it is used to fatten live-stock. Although the Territory is not considered within the cotton belt, its richest field product is cotton, the yield in 1897 was 140,000 bales, valued at over \$5,000,000. Besides supplying the home market the Territory marketed several thousand tons of prairie hay. Kaffir corn and cane had each a profitable and encouraging output. Oats yield as high as 85 bushels per acre, with a general average of 45. Cantalopes and other melons thrive finely, some of the latter reaching 75 pounds in weight. In 1897 there was a product of 175,000 bushels of castor beans, worth \$1 a bushel. Other crops that have attained successful cultivation are Irish and sweet potatoes, turnips, sugar beets, broom corn, and the principal varieties of garden vegetables. The Territory already has high rank as a fruit-growing region. In 1897 there were over 4,648,000 fruit trees of all kinds, and from 6,000,000 to 8,000,000 jars were sold for local preserving and packing. Live-stock comprised in 1898: horses, 203,974; mules, 38,897; cattle, 775,851; swine, 257,740; and sheep and goats, 52,868.

Manufactures.—In the eight years of its existence the Territory has taken rapid strides in manufacturing. In 1898 there were 22 flour mills, 4 cotton compressors, 4 cotton seed oil mills, 8 ice and cold storage plants, more than 100 cotton gins, stone quarries in operation in every county, numerous creameries and cheese factories, wineries, machine shops, planing mills, sash and blind factories, and cigar, broom, carriage and other manufacturing plants.

Education.—In 1898 there were 90,585 persons of school age in the Territory, of whom 70,309 were enrolled in the public schools, and about 39,400 were in daily attendance. There were 1,879 school districts; 1,696 school houses; 2,073 teachers; public school property valued at \$482,972; and expenditures, \$332,740, including \$206,857 for teachers' salaries. For higher education there were 3 public high schools; 3 private secondary schools; territorial university; agricultural and mechanical college for white students at Stillwater, and one for colored students at Langston;

normal schools at Edmond and Alva, and a number of high grade denominational schools. There are more than a dozen schools for Indians, the Chilocco school being particularly noteworthy. The periodicals number 108, of which 11 are dailies, 85 weeklies and 10 monthlies.

Churches.—In 1898 there were 607 churches, chapels and mission stations, with a membership of 39,402 divided denominationally as follows: Presbyterian, 28; Protestant Episcopal, 25; Baptist, 270; Methodist Episcopal, 78; Friends, 5; Congregational, 60; Roman Catholic, 34; Methodist Episcopal, South, 88, and Christian, 19. The Sunday schools numbered 1,000, and had 6,000 officers and teachers, and 40,000 scholars.

Banks.—On Oct. 31, 1898, there were 6 national banks in operation and 3 in liquidation. The active capital aggregated \$300,000; circulation, \$63,810; deposits, \$910,924; resources, \$1,239,584. The territorial banks numbered 49, and had capital, \$613,328; deposits, \$1,499,149; resources, \$2,244,037. During the year 6 new territorial banks have been established, 2 have consolidated, and one has failed. There has been a 75 per cent. gain in deposits since July 1897. During the year one national bank went into voluntary liquidation, and two new ones were established. The deposits have increased 50 per cent.

Insurance.—All the insurance business in Oklahoma is carried on by companies belonging elsewhere. In 1898 there were 14 life companies, 26 fire companies, and 4 miscellaneous ones authorized to do business in the Territory.

Railroads.—On Jan. 1, 1898, the total length of the various railroads was 484.97 miles. The Territory can now be reached by direct trunk lines from any portion of the country and all parts of it are readily accessible to railroads. Many new lines of railroads have been projected in Oklahoma during the past year, nearly a dozen new companies having been chartered and half as many surveys made for new lines or extensions of those already in operation.

Finances.—On June 30, 1898, the assessed valuations aggregated \$40,623,816, an increase of \$8,589,064 in a year; tax rate, \$4.30 per \$1,000. The bonded debt was \$48,000, incurred for educational buildings, and there were outstanding warrants aggregating \$251,530. The bonded debts of the counties amounted to \$926,300. During the year, the Territory paid \$61,320.31 for the care and transportation of the insane, who numbered 196. There are only 155 convicts in the penitentiary; there is 1 convict to each 2,150 of population.

Population.—According to returns by the several counties, the population in 1898 was 311,400, a gain of 13 per cent. in two years. The Indian population of the Osage, White Eagle, Sac and Fox, Darlington and Kiowa agencies aggregated 13,033, and, contrary to usual belief, nearly every tribe showed an increase in numbers.

Government Lands.—There are still many thousands of acres of government lands in the Territory which may be acquired under the homestead laws; the settler must take up his residence on the land and occupy and cultivate it for five years. In Greer and Beaver counties the fees are \$14 and the settler gets the land free at the expiration of the five years. In other counties the land costs from one to two and one-half dollars an acre. During the year settlers have taken up 1,127,466 acres of land.

Public Officers.—The vote for delegate to Congress in 1898 was: Keaton (Fus.), 19,088; Dennis T. Flynn (Rep.), 28,456, and Hankins (Pop.), 1,269, the Republican candidate's plurality was 9,368. The State officers are: Cassius M. Barnes, Governor; William M. Jenkins, Secretary; F. M. Thompson, Treasurer; H. S. Cunningham, Attorney-General, and S. N. Hopkins, Superintendent of Education and Auditor. All are Republicans. Chief Justice, Frank Dale; Associates, John C. Tarsney, J. R. Keaton, A. G. C. Bierer, and John L. McAtee; Clerk, Edgar W. Jones. All are Democrats. There are 5 Democrats, 6 Fusionists, 25 Republicans and 3 Populists in the Territorial legislature.

OKUMA, COUNT. See JAPAN.

OLD CATHOLICS report in the United States for 1898, 8 churches, 12 ministers, and 1,050 members. The archbishop is now J. R. Vilatte Duvall; the bishops are S. Kaminske, Buffalo, and A. Kozlowski, Chicago.

OMAHA EXHIBITION, or TRANS-MISSISSIPPI AND INTERNATIONAL EXHIBITION, held at Omaha, Neb., from June 1 to November 1, 1898, was intended to exhibit the products and industries of the States and Territories west of the Mississippi river. The corporation had a capital of \$1,000,000 and was managed by 50 directors, and an executive committee of six department managers. Congress passed a bill recognizing the exhibition as national and international, and appropriating for it \$200,000. Foreign exhibitions were permitted. Subscriptions equaling \$1,000,000 were accepted and Omaha and other cities received appropriations exceeding \$250,000. The officers were Gurdon W. Wattles, President; Alvin Saunders, Vice-President; John A. Wakefield, Secretary; Zachary T. Lindsey, Chairman of Executive Committee and Manager of the Department of Ways and

Means; Edward Rosewater, Manager of the Department of Publicity and Promotion; Freeman P. Kirkendall, Manager of the Department of Buildings and Grounds; Edward E. Bruce, Manager of the Department of Exhibits; Abram L. Reed, Manager of the Department of Concessions and Privileges, and W. N. Babcock, Manager of the Department of Transportation.

The exposition grounds, aggregating 20,000 square feet, were situated in the Kountze tract on Sherman avenue, between Twentieth and Twenty-fourth streets, and the main entrance was on Twentieth street, through an Arch of States, leading into a Grand Canal Court. The buildings were stationed on either side of a large lagoon, and together with the improvements of the grounds cost \$1,200,000. The Government Building stood on the west; the Administration Building was at the north; and the others were the Agricultural, Fine Art, Electricity, Machinery, Mines and Mining, Manufactures, the Auditorium, Horticulture, Dairy, Apiary, Poultry, Live-Stock, Terminal and Nebraska and other State Buildings.

Among the novel amusements was Sherman's Umbrella, 300 feet high, to which people could be elevated by means of a mechanical contrivance and revolved slowly within a circle 250 feet in diameter. The industries of the American Indian were exhibited in an enormous wigwam.

The Musical Congress gave evidence of the interest in musical culture in the West. Thomas's Orchestra played Dvorák's *American Symphony*, Macdowell's *Indian Suite*, and Kroeger's *Hiawatha Suite*; Chadwick's compositions, and the works of other American composers were heard.

A. H. Griffiths, Director of the Art Museum of Detroit, collected the pictures exhibited. The general architects of the exhibition were Messrs. Walker and Kimball, a firm of Boston and Omaha. A good general idea of this exhibition may be gathered from Albert Shaw's article, entitled *The Trans-Mississippians and their Fair at Omaha* (*Century Magazine*, October, 1898), in which he says: "It was not to be expected that the fair at Omaha improvised, so to speak, within a period of a little more than a year, could have rivalled in extent or magnificence the Columbian Exposition for the success of which such vast resources were poured out, and under circumstances so favorable in every way. Nevertheless, the trans-Mississippi Exposition, as an architectural spectacle to be viewed at a stroke of the eye from any one of several standpoints, does not suffer in comparison with the White City of five years ago."

ONTARIO, a province of the Dominion of Canada, with an area of 222,000 sq. m. Capital, Toronto.

Mineralogy.—The province possesses near Sudbury the only nickel deposits of any value on the hemisphere. These have recently become more important than ever before, because of the large demand for the metal for use in manufacturing armor plates for war vessels. The largest shipments in the last five years were to the United States, and these were so extensive that the Dominion government has considered the question of restricting this exportation in order to retain sufficient metal for the needs of the British navy. The production in 1897 was 3,997,647 pounds, value, \$1,399,176. Iron mining yielded 15,270 tons; gold, \$189,294; and gypsum, 3,305 tons. Exports of native copper aggregated 3,661,170 pounds.

Fisheries.—In 1896 the value of the total yield was \$1,605,674; principal fisheries, trout, whitefish and herring; value of all apparatus used, \$838,532; exports of fisheries products (1897), \$372,599.

Agriculture.—The estimated value of all farm land in 1896 was \$557,468,270; farm buildings, \$205,235,429; farm implements, \$50,730,358; and live stock, \$96,857,566. The yield of the principal crops was: fall wheat, 18,022,748 bushels; spring wheat, 7,283,391; oats, 64,476,051; corn, 20,762,588; barley, 16,458,522; peas, 14,293,825; and turnips, 50,852,061.

Commerce.—In the year ending June 30, 1897, the imports of merchandise aggregated in value, \$43,092,248; duties collected, \$7,100,737; exports, \$39,313,226. The registered shipping of all kinds numbered 2,320, of 227,277 tons, and vessels, British and foreign, engaged in the coasting trade which arrived at and departed from provincial ports, had a total tonnage of 10,995,311. Navigation was facilitated by 184 light stations and 3 light ships, with a total of 238 lights.

Banks.—In 1897 there were 462 post-office savings banks, with 91,612 depositors and \$20,303,473 deposits, and one government savings bank, with 1,456 depositors and \$600,942 deposits. The exchanges at the clearing house at Hamilton during the year aggregated \$33,268,000. Loan companies and building societies had paid-in capital, \$35,574,504; deposits, \$18,810,772; loans, \$107,583,519; liabilities, \$129,722,695; and assets, \$130,313,788.

Railways and Post-Offices.—On June 30, 1897, the total length of all steam railways was 6,647 miles, the construction of which had been aided by the provincial government with \$7,357,117 in loan and bonus and by municipalities with \$12,420,754 in loan, bonus, and subscription. The provincial grant in 1897 was \$24,579, and those



1



2

OMAHA EXPOSITION.—1, The Machinery and Electricity Building. 2, Looking west in
 (By courtesy of *Review of Reviews*.) Fine Arts Building. 3, Main se



3



4



5

6. Liberal Arts Building. 3. The Fountain of Neptune. 4. An interior view of the
107 of Government Building.

of municipalities, \$1,089,111. There were 3,198 post-offices, which handled in the year 65,500,000 letters and 16,750,000 postal cards, and 654 money-order offices, which issued 653,724 orders.

Education.—Reports for 1896 showed, school population, 591,717; enrollment, 481,948; average attendance, 271,354; public schools, 5,996; teachers, 8,988; receipts, \$4,886,112; and expenditures, \$4,149,207. Of the total receipts, \$1,470,465 was from the provincial government, and \$3,415,647 from other sources. Besides the public schools there were 204 others, with 27,637 pupils and 622 teachers. Public libraries numbered 374 with 942,187 volumes, and periodicals (1898), 531, of which 52 were dailies, 382 weeklies, and 77 monthlies.

Finances.—The revenue of the province in the year ending Dec. 31, 1897, was \$4,139,848; expenditures, \$3,767,676. On that date the railway liabilities amounted to \$1,986,292, with payments extending over 30 years, and the surplus of assets over liabilities presently payable was \$5,124,664.

Population.—In 1897 the number of Indians in the province was 20,208, who cultivated 52,934 acres of land, had 16,177 head of live-stock, and received \$332,104 for their various industries. The government maintained 81 schools for Indian youth, which had 2,831 enrolled pupils and 1,529 in average attendance. Local estimates in 1898 gave Toronto, 194,314 population; Ottawa, 53,463; Brantford, 12,600; Belleville, 12,500; St. Thomas, 11,300; Brockville, 9,900; Chatham, 9,800; Glencoe, 9,784; Woodstock, 9,000; Barrie, 6,549; Orillia, 6,000; Toronto Junction and Ingersoll, each, 5,000; Niagara Falls, 4,900; Smith's Falls, 4,200; Alimonte and Wallaceberg, each, 3,200; and Midland, Wiarton and Wingham, each, 2,500. See CANADA.

OPERA. See MUSIC.

OPHTHALMOLOGICAL SOCIETY, AMERICAN, organized in June 1864. President, G. C. Harlan, M. D., 1515 Walnut st., Philadelphia, Pa.; Secretary, S. B. St. John, M. D., 26 Pratt st., Hartford, Conn.

ORANGE FREE STATE, one of the few independent States of Africa, is situated in the southern part of the continent between Cape Colony and Natal on the south and east and the Transvaal on the north. It was settled by the Boers upon their withdrawal from Natal when the latter was declared a British colony. Its area is estimated at 48,326 sq. m. and its population at 77,716 whites and 129,787 natives, giving a total population of 207,503. The capital is Bloemfontein. The land is very fertile in parts, but the main occupation is grazing and the farms are of great size. Among the chief products are live-stock (especially sheep) and animal products. The mineral resources are said to be considerable and diamonds and gold are found. The foreign trade passes through the ports of Cape Colony and Natal and these two countries absorb the greater portion of the commerce. The Orange Free State has a republican form of government, the executive authority being vested in a president, who is chosen by universal suffrage for five years. In 1898 the president was Judge Steyn. There is a legislative assembly, whose members are chosen by vote of the adult white males for four years; a property qualification restricts the suffrage. The chief religious body is the Dutch Reformed Church with about 70,000 members. Instruction is under the control of the government and is not compulsory. In the spring of 1898 on the occasion of a visit to Bloemfontein by Sir Alfred Milner, the President of the Free State gave assurances of friendship toward the British colonies, stating that the tension of popular feeling that followed the Jameson raid had subsided.

ORATORIO SOCIETY OF NEW YORK, founded by Dr. Leopold Damrosch in 1873. The society celebrated its 25th anniversary in 1898. (See MUSIC.) President, Andrew Carnegie; Secretary, William B. Tuthill.

ORDER OF THE EASTERN STAR, organized in New York in 1868, is composed of Masons, and the wives, mothers, sisters, daughters and widows of Masons. There are 24 Grand Chapters and 7,132 members.

ORDER OF FOUNDERS AND PATRIOTS OF AMERICA, founded in 1896, has now 375 members. Its objects are "to bring together and associate congenial men whose ancestors struggled together for life and liberty, home and happiness, in the land when it was a new and unknown country, and whose line of descent from them comes through patriots who sustained the Colonies in the struggle for independence in the Revolutionary War; to teach reverent regard for the names and history, character and perseverance, deeds and heroism, of the founders of this country and their patriot descendants; to teach that the purpose of the founders could have had no lasting result but for their patriot sons; to inculcate patriotism; to discover, collect, and preserve records, documents, manuscripts, monuments, and history relating to the first colonists and their ancestors and their descendants, and to commemorate and celebrate events in the history of the Colonies and the Republic." Governor-General, General Stewart L. Woodford; Secretary-General, Charles M. Glazier.

OREGON, a Pacific Coast State of the United States, with an area of 96,030 sq. m. Capital, Salem.

Mineralogy.—The principal economic productions in the calendar year 1897 were: gold, 65,456 fine ounces, value, \$1,353,100; silver, 69,000 fine ounces, coining value, \$89,212; coal, 107,289 short tons, spot value, \$291,772; clay products, from 74 plants, principally brick and tile, \$124,803; and granite, \$1,125.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 327,744 bushels, value, \$196,646; wheat, 24,708,260, \$15,319,121; oats, 4,953,555, \$1,981,422; barley, 812,996, \$398,368; rye, 82,526, \$59,419; buckwheat, 3,430, \$1,989; potatoes, 1,271,596, \$597,650; and hay, 1,164,098 tons, \$8,439,710—total value, \$26,994,325. Live-stock comprised: horses, 185,844; mules, 5,609; milch cows, 116,581; other cattle, 573,646; sheep, 2,575,468; and swine, 216,430—total head, 3,673,578. The State ranked fourth in the number of sheep.

Public Lands.—On June 30, 1898, out of a total land surface of 61,626,218 acres, 5,467,702 acres were reserved, 20,260,647 acres appropriated, and 35,897,869 acres unreserved; and of the unreserved and unappropriated area 24,095,763 acres had been surveyed. The reserved area included three forest reserves aggregating 4,653,440 acres.

Salmon Industry.—The salmon fisheries and canneries on the Columbia river employed 6,471 persons in 1897, and the coast streams and bays 865 more. The canned products amounted to 552,711 cases, of which 409,954 cases were packed on the Oregon side of the river, and 144,777 on the Washington side. Canned products had a total value of \$2,219,311, and the fresh shipments, \$151,804. Reports at the close of 1898 indicated a large falling off in all Pacific coast salmon fisheries and canneries. The spring pack of the Columbia river was placed at 360,000 cases, against 476,924 cases in the previous spring. Most of the canners, expecting a very large pack, sold futures at low prices, and many of the districts were oversold, those of the Columbia river by at least 100,000 cases.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise in the customs districts of Oregon, Southern Oregon, and Willamette, aggregated in value \$1,532,842; exports, \$14,261,828; decrease, in imports in a year, \$107,257; increase in exports, \$7,249,470; net increase of foreign trade, \$7,142,213.

Railroads.—On Jan. 1, 1898, the total length of all railroads in the State was reported at 1,553.23 miles, of which 31 miles were constructed during the previous year. Two new roads have been opened, the Columbia Southern and the Coos Bay, Roseburg and Eastern, both opening up rich sections of the State.

Education.—The latest school statistics available at the time of writing were for the school-year 1895-96. They showed a total school population of 129,620; enrollment, 87,212; attendance, 61,721; school houses, 1,940; teachers, 3,317; public school property valued at \$2,988,312; and expenditures, \$1,197,109, including \$784,968 for teachers' salaries. For higher instruction there were 12 public high schools; 18 private secondary schools; 8 colleges and universities, with 75 professors and instructors, 1,168 students, and \$82,697 income; 3 public normal schools; a technical school; and one theological, 2 law, and 2 medical schools. The State agricultural college at Corvallis, endowed by Congress, received from the federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 204 periodicals, of which 20 were dailies, 145 weeklies, and 27 monthlies.

Banks.—On Oct. 31, 1898, there were 29 national banks in operation and 13 in liquidation. The active capital aggregated \$2,570,000; circulation, \$1,018,439; deposits, \$10,582,345; reserve, \$2,847,702; resources, \$17,276,504. The State banks, June 30, 1898, numbered 18, and had capital, \$1,014,159; deposits, \$3,232,520; resources, \$4,386,617; surplus and profits, \$111,151. During the year ending Sept. 30, 1898, the exchanges at the United States clearing house at Portland aggregated \$94,572,454, an increase in a year of \$27,133,437.

Finances.—The receipts of the treasury in the eighteen months ending June 30, 1898, with the balance from Dec. 31, 1896, amounted to \$2,232,495; disbursements, \$863,523; leaving balance, \$1,368,971. The total valuations for 1897 aggregated \$143,539,696; indebtedness and exemptions, \$8,622,592; total equalized valuation, \$134,917,104; tax rate, \$3.50 per \$1,000. The only bonded debt of the State comprises some small bonds aggregating \$1,829, which the State has never been able to get in to redeem.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 435,000. Local authorities gave Portland 81,342; Salem, 8,000; The Dalles, 4,000; Pendleton, 4,000.

Elections.—The Republicans swept this State with an overwhelming majority. Many country precincts which went for Bryan in 1896 gave Republican majorities. The issue was the silver question. The Republican platform declared: "We are in favor of the maintenance of the present gold standard. We are unqualifiedly opposed to the free coinage of silver and to all other schemes looking to the debasement of

the currency and the repudiation of debts. We believe that the best money in the world is none too good to be assured by the government to the laborer as the fruit of his toil, and to the farmer as the price of his crop. We condemn the continued agitation for free silver as calculated to jeopardize the prosperity of the country and to shake the confidence of the people in the maintenance of a wise financial policy. We particularly condemn as unpatriotic the efforts of the free silver agitators to array class against class and section against section. We declare that the interests of all classes and all sections of our country alike demand a sound and stable financial system." Thus the Republican platform squarely indorsed the maintenance of the gold standard and the campaign was fought chiefly upon the financial issue; but many Republicans declared that the predominant issue was the support of the administration while conducting a foreign war. The Populists and Democrats nominated separate State tickets, and the bad feeling resulting prevented complete fusion in the Congressional elections. The fusion ticket only polled 34,330 votes against 46,662 in 1896, and the Republicans elected T. T. Geer Governor by a plurality of 10,774. Both the Republican candidates for Congress were elected by good majorities, and three-quarters of the new legislature is Republican.

National Representatives and State Officers.—Oregon's Representatives are: Thomas H. Tongue (Rep.), from Hillsboro, and M. A. Moody (Rep.), from Dalles. Senators: George W. McBride (Rep.), from St. Helen, and Joseph Simon (Rep.), from Portland. Officials (1899): T. T. Geer, Governor; F. J. Dunbar, Secretary and Auditor; C. S. Moore, Treasurer; B. B. Tuttle, Adjutant-General; D. R. N. Blackburn, Attorney-General. All are Republicans. Chief-Justice, Charles E. Wolverton; Justices, Robert S. Bean and Frank A. Moore; Clerk, J. J. Murphy. All are Republicans. The State legislature is composed of 68 Republicans, 19 Populists and Free Silver, and 3 Democrats.

ORIENTAL SOCIETY, AMERICAN, founded in 1842 for the cultivation of Asiatic, African, and Polynesian languages and for publishing works relating to these languages, has now 354 members. President, D. C. Gilman, Johns Hopkins University; Corresponding Secretary, E. W. Hopkins, Yale University.

ORLEANS, DUC D', PRINCE LOUIS PHILLIPPE ROBERT, the Royalist pretender, is the eldest son of the Comte de Paris. He was born February 6, 1869, and made himself conspicuous by his entry into Paris in violation of the Expulsion Act in 1890, when he made an attempt to enter the military service, urging his right as a Frenchman to fight for his country. He became prominent in connection with the Dreyfus affair (see FRANCE, paragraphs on History) by publishing a manifesto on November 26, 1897, saying that if he should regain the crown he would know how to maintain the honor of the army against such vile insinuations as had been made by its foes. He took sides openly with the opponents of revision, making a bid thereby for popular favor, but appears to have accomplished little to this end.

ORNITHOLOGISTS' UNION, AMERICAN. See ORNITHOLOGY (paragraph Organizations).

ORNITHOLOGY. Probably no branch of biology has made more rapid strides into popular favor in the last few years than the study of birds, and the year 1898 has shown even a more marked interest on the part of the public. There has certainly been no decrease in the magazines and other periodical publications on ornithology, while it is said on the best of authority that during the past five years New York and Boston publishers have sold more than 70,000 copies of popular books about birds.

Organizations.—There has been a marked increase in the number of Audubon societies, which now number more than 16,000 members, 2,400 of whom are found in Massachusetts alone. This organization has for its objects the dissemination of information about our common birds with a view to preventing their destruction, and the creation of a public sentiment which will put an end to the barbarous custom of wearing song birds as articles of apparel. The American Ornithologists' Union has also largely added to its numbers and is in as prosperous a condition as could be desired. The sixteenth annual Congress was held at Washington in November, the public sessions lasting three days. The attendance was unusually large, and the papers read were of great interest. The Union numbers at the present time more than 700 members, of whom more than four-fifths are associates. One afternoon and evening of the Congress were given up to papers illustrated by means of the stereopticon. These were chiefly of a popular character and were very much enjoyed. One unique feature at one of the sessions was the graphophone demonstration of a brown thrasher's song, taken from a caged bird. The report of the "Committee on Bird Protection" was of unusual value and will be printed in pamphlet form for general sale. The report especially commends the efforts of Senator Hoar to secure the passage of a bill by Congress to prevent the importation of birds or parts of birds for millinery purposes. Unfortunately the bill has not yet become a law. The com-

mittee urges particularly the necessity of effectually preventing the taking of birds' eggs by boys, and the shooting of song birds for "sport." The quarterly journal of the Union, the *Auk*, has maintained its high standard, and the colored plates have added greatly to its interest and value. Considerably more than one-third of the papers published have dealt with the less technical and more popular side of ornithology, the habits, especially the breeding habits, of birds coming in for a large share of attention. The British Ornithologists' Club has also enjoyed a very successful year, holding its annual meeting in October. But the members were called on to mourn the death of one of the most eminent of their number, Mr. Osbert Salvin, the well-known writer on Central American birds.

Literature.—Popular books on ornithology have shown no falling off either in supply or demand in the United States, and several notable ones have appeared during the year. Among these may be mentioned Blanchan's *Birds That Hunt and Are Hunted*, an account of the life histories of 170 American birds of prey, game-birds and water-fowl; Scott's *Bird Studies*, treating of the land birds of eastern North America, some 650 species; and Miss Merriam's *Birds of Village and Field*, which tells the story of 145 species of our common eastern birds. Aside from these more popular books, the year 1898 has witnessed the publication of a number of important contributions to scientific ornithology. Among these may be counted as of special interest, Blandford's *Birds of India* (volume four of a series on the fauna of British India), in which the author recognizes 1,627 species from that region; Beddard's *Structure and Classification of Birds*, an important anatomical work, though not by any means above criticism; and Evans' *Birds*, in the Cambridge Natural History series. But beyond question the most important matter in ornithological literature is the completion of the famous *British Museum Catalogue of Birds*. This monumental work has been in course of publication for 25 years, and the 27th and last volume appeared during the past year. The number of species of birds recognized is 11,614 divided into 2,255 genera and 124 families. Of course in a publication of this character, prepared by a number of different writers (eleven in all, though Dr. R. Bowdler Sharpe has been the chief) the volumes are by no means of equal value. Some represent an extreme of conservatism which is undoubtedly open to criticism, while others are in certain particulars almost radical. Nevertheless the value of the work is enormous, as the working out of the synonymy alone is of the greatest practical value to all ornithologists.

Discoveries.—The progress of the year in our knowledge of the geographical distribution of many birds has been one of its noteworthy features. The breeding grounds of some of our well-known water-birds have long been unknown, but each year sees the home of some species added to our list of known breeding places. This year the Ivory Gull (*Pagophila alba*) has given up its secret, as it has been found breeding in numbers on the smallest of the King Charles islands. But the most interesting find of the year from an ornithologist's point of view was the capture on August 8, in New Zealand, of a fourth specimen of the rare flightless rail, *Notonis mantelli*. The first specimen ever taken was captured in 1849 by Mr. W. Mantell, in a very rugged country in the southwestern part of the southern of the two main islands of New Zealand. The skin of this bird is carefully treasured in the British museum. In 1851, another specimen was secured in the same district by some natives and this bird is also in the museum in London. Not for nearly 30 years was the bird again seen, but in 1879 a third specimen was captured, which was purchased for the Dresden museum. Later on an incomplete skeleton was found, which is now in the museum at Otago, N. Z. The specimen of this summer was killed by a dog in the bush adjoining Lake Te Anau, in the same district where the others have been found. The ultimate destination of the specimen has not been determined. To have maintained an existence for 50 years, the bird cannot be as rare as the small number of specimens known would seem to indicate, and it is to be hoped that a careful search will be made and more learned of the habits and life history of this curious bird.

ORTHOPÆDIC ASSOCIATION, AMERICAN, organized 1877. Next annual meeting May 16-18, 1899, at New York City. President, W. R. Townsend, M. D.; Secretary, John Ridlon, M. D., 103 State st., Chicago, Ill.

ORTON, ARTHUR, the Tichborne claimant, born in 1840, died at Marylebone, London, March 31, 1898. He will be remembered as the famous impostor who in response to an inquiry made in 1866 by Lady Tichborne concerning her son, generally believed to have been lost at sea, posed as the missing heir so successfully that Lady Tichborne thought she recognized her son. Orton had just come to England from New South Wales. He was put on trial and the case remained in court until 1874, when he was found guilty of perjury and was sentenced to penal servitude for fourteen years. In 1884, however, he was pardoned, after which he appeared for a number of years in lecture and music halls as the "ill-used baronet." In 1895 he published his *Confessions*.

OSBORN, THOMAS A., ex-Governor of Kansas, died at Meadville, Pennsylvania, Feb. 4, 1898. He was born there Oct. 26, 1835; learned the printing trade and studied law, being admitted to the bar in Michigan in 1857; removed to Kansas and was elected to the State Senate in 1859, and three years later Lieutenant-Governor; he was United States Marshal, 1864-66; and in 1872 was elected Governor and re-elected in 1874. In March 1877, President Hayes appointed him Minister to Chile, and in 1881 he was transferred to Brazil. He served in both positions with credit, and received from the Brazilian Emperor the decoration of the Grand Cross of the Order of the Rose, the highest honor conferable upon a foreigner.

OSIRIS, TOMB OF, so-called. See *ARCHÆOLOGY*.

OSTEOPATHY. The past year has shown an increasing interest among a certain class of people in a pseudo-science, to which has been given the name osteopathy. The healers forming the sect which propagates and practices the new system of so-called treatment base their name upon the statement that disease is caused by "slight displacement of some bone which causes obstruction to the flow of one of the fluids" of the body, and claim to cure disease "by utilizing the system of drugs which the body has within itself to cure all infirmities." Legislation has been so influenced in certain localities that Iowa, North Dakota, Michigan, Illinois, North Carolina and Vermont have granted osteopaths the right to practice within their borders. Perhaps no better explanation of the belief of the sect can be given than to use the words of the founder of osteopathy, A. T. Sill, who writes as follows in the *Journal of Osteopathy*: "I feel to answer (*sic*) through the *Journal of Osteopathy* questions that are asked by thousands of persons annually. And as time adds days and years the number of persons who ask those questions have multiplied to such greatness in numbers that it is absolutely impossible to find the time to answer them in detail. And I am not sure that I can answer all of them through the *Journal*, but will try and so arrange that a few of the most common ones will be answered as best I can. By my method of reasoning I arrive at the conclusion that man was, after receiving his form, like unto the world in which he dwells, and that in his body could be found all the mineral, vegetable and animal substances that could be found in the beast of the field, the fowls of the air, fishes of the sea, both great and small, in short, all that was contained in this and all other planets and beings, from the throne of God (Himself included) to the lowest form of animated beings; that in the human being all attributes of mental and physical were represented in kind. With this conclusion I proceeded and did obtain what I have proclaimed and proven to be truths universal in kind and action, submitting to and being governed by one common law. I reasoned that all effects as are shown in disease with the result of the productions of the truths of the one great common law, mind and motion expressing themselves through matter. Motion is an effect of life with its powers. Disease in any form or presentation was another effect. Conceptions of beings, diseases, and worlds, were the biogenic answer of the wombs of nature either large or small, believing while I was in the chambers of sober and intelligent nature where honest reason only can dwell, that it was safe to follow the teachings of the principle that made no mistakes that I could detect. . . . The world's system of cures by drugs are now and always have been based on three principles; namely: Opiates, purgatives, and stimulants. And the difference there is in the schools of medicine are about all told in the quantities to be given. All are deadly poisons, but try to get the same results. Allopathy starts the ball rolling by big pills, eclecticism the same, but claims that vegetable medicines are better than mineral preparations. Then the homeopath closes by pills of less size, and if they fail he drives morphine under the skin and spills it in the fascia, which carries the opium to the brain and produces effects by paralyzing sensation. And on these three principles all depend."

OTIS, ELWELL STEPHEN, Major-General, U. S. Volunteers, was born in Maryland, March 25, 1838; studied law and was admitted to practice in New York. In September 1862, he entered the Union service as a Captain of the One Hundred and Fortieth New York Infantry, and in little more than a year was promoted to be its Lieutenant-Colonel. He saw much active service in the Fifth Corps of the Army of the Potomac and fought at Chancellorsville, Fredericksburg, Rappahannock Station, Spottsylvania, the Wilderness, Gettysburg, Totopotomoy Creek, the North Anna, Bethesda Church, Petersburg, Chapel House, and Weldon Road. In the last-named engagement he received a severe wound through the face and head, from which he has never entirely recovered. At Spottsylvania he was brevetted Colonel for gallant and meritorious services, and later received the brevet of Brigadier-General. In July 1866, he entered the regular army as Lieutenant-Colonel of the Twenty-second Infantry, his rank being the same as that he held with his volunteer regiment. He remained with this regiment until 1880, when he was promoted to the colonelcy of the Twentieth Infantry, and in 1893 became Brigadier-General, *vice* General Carlin, retired. General Otis has an excellent record as a frontier commander and Indian

fighter, and is noted for his insistence upon strictness of discipline and orderliness among his men. In 1874-75 he was Inspector-General of the Department of Dakota: in 1881 he organized the United States Infantry and Cavalry School. General Otis is a man of literary tastes; he has never given up his law readings, and being recognized as a man of judicial ability, he has frequently been called upon to preside at military courts. He has written an authoritative work entitled *The Indian Question*. Upon the outbreak of the war with Spain, he was the senior Brigadier-General of the army, and was in command of the Department of Colorado. On May 4, 1898, he was nominated by President McKinley to be a Major-General of Volunteers, and when General Shafter was ordered to Tampa he was transferred to the Department of California, and remained at San Francisco until he sailed for Manila as the chief of General Merritt's staff. On Aug. 30 the latter sailed from Manila to confer with the Peace Commissioners at Paris and to General Otis was transferred the command of the troops in the Philippines.

OTOLOGICAL SOCIETY, AMERICAN, organized July 12, 1868, at Newport, R. I. Last annual meeting was in July 1898, at New London, Conn. President, Arthur Matthewson, M. D.; Secretary, J. J. B. Vermeyne, M. D., New Bedford, Mass.

OXYGEN, MAGNETIC SUSCEPTIBILITY OF LIQUID. See PHYSICS (paragraph Magnetic Susceptibility of Liquid Oxygen).

OYSTER FISHERIES. See FISHERIES (third paragraph).

OZONE. Ozone is now so cheaply and so plentifully produced by means of electricity that it is displacing former oxidizing agents very rapidly in the arts. It is now used for aging wood for use in manufacturing musical instruments, "maturing" wine and spirits, sweetening foul beer casks, drying and thickening oils, bleaching waxes and fats, seasoning lineoleum, bleaching fabrics and yarns and sterilizing drinking water. It does not produce any by-products, solid or liquid, and therefore its use in the manufacture of oils, fats and organic chemicals is increasing. Louis Troost has liquefied ozone by immersing it in a vertical tube in liquid oxygen. It was found for the atmospheric pressure of 15 pounds, that the boiling point was -119 degrees centigrade.

PACKARD, SILAS SADLER, founder of Packard's Business College, New York, died in that city, Oct. 27, 1898. He was born in Cumington, Massachusetts, April 28, 1826. In 1893 he was President of the Congress of Business Education at the World's Fair, Chicago. He wrote the *Packard Manual of Bookkeeping and Correspondence* and the *Packard Arithmetic*.

PÆDIATRIC SOCIETY, AMERICAN, organized in Washington, D. C., September 18, 1888. Next annual meeting in Deer Park, Md., in June 1899. President, W. P. Northrup, M. D., of New York; Secretary, S. S. Adams, M. D., 1 Dupont Circle, Washington, D. C.

PAINTING in 1898, HISTORY OF.—*Discoveries*.—The most remarkable discovery of the year was made in the Church of the Ognissanti, Florence, where pictures were removed revealing the long-lost frescoes by Domenico Ghirlandaio. They agree exactly with Vasari's description: "The first pictures painted by Domenico were for the Chapel of the Vespucci in the Church of the Ognissanti, where there is a dead Christ with numerous saints. Over an arch in the same chapel there is a 'Misericordia,' wherein Domenico has portrayed the likeness of Amerigo Vespucci, who sailed to the Indies." Beneath the mantel and outspread hands of the Virgin kneel Amerigo Vespucci and his family. He is next to the Virgin at her right, and is represented as a handsome youth of twenty. The frescoes are well preserved. Beautiful wall-paintings were discovered in Pompeii in small houses (Insula VI 15), representing Artemis and Apollo in one house; Selene with Eros and Endymion, Artemis and Zeus, and Hercules and Omphale in another; and two female figures holding a scroll, in a third. Professor Mau found three river landscapes, also, Perseus (with Medusa's head) and Andromeda; Paris and Helen; Cupids; Aphrodite; and Dionysus with his thyrsus. In the Chapel of the Church of St. Jacques, Ghent, two pictures were discovered—the "Nativity" and the "Resurrection of Christ," by Michael Coxie (Coxie), a famous court painter of Philip II. It is supposed that they formed the side-pieces to "Calvary," by the same artist, which adorns the altar of that church. Some paintings of the school of Giotto were also found in the Abbey of San Pastore, Rieti, Italy.

Great Britain. Events of the Year.—The civil service estimates for the year ending March 31, 1899, allowed the National Gallery, London, and Gallery at Millbank £16,274; the National Portrait Gallery was given £6,025; the Wallace Gallery, £5,927; the National Gallery of Scotland, £4,400; and the National Gallery of Ireland, £2,504. The sum for education, science and art amounted to £11,965,796, an increase of nearly £460,000 for the year. The British government voted £25,000 for

alterations of Hartford House, which shelters the Wallace collection; Parliamentary investigation of the South Kensington museum revealed abuses, which led to reforms; the private Horniman museum at Forest Hill was presented to London by its owners; and Leighton House was handed over to the Leighton House Committee by Lord Leighton's sisters. Mr. H. H. Armstead, C. Purdon Clarke, Sir J. D. Linton, and Sir E. J. Poynter were appointed art commissioners to the Paris Exposition of 1900. Mr. Henry Tate received a baronetcy; Sir E. Poynter was presented with the degree of D. C. L. from Cambridge; Mr. Hawes Turner succeeded Mr. Eastlake as Keeper of the National Gallery; Mr. A. Crofts was elected Keeper of Royal Academy in place of P. Calderon, deceased; Walter Crane became Principal of the Royal College of Art; E. Waterlow, President of the Royal Water Color Society in place of Sir John Gilbert; Frank Walton, President of the Society of Oil Painters, of which Alma Tadema and Sargent were made honorary members; E. J. Gregory, George Aitchison, B. W. Leader, Seymour Lucas and E. A. Abbey were elected Royal Academicians, and Lionel Smythe, H. H. La Thangue and C. Napier Henry, Associates; Holman Hunt and A. Gilbert were made honorary members of the Royal Society of British Artists, and Wilfred Ball, A. L. Christie, T. Browne, and T. George, were elected members; the Princess Louise was made honorary member of the Royal Society of Painter-Etchers; J. Gülich, Mortimer Menpes, W. W. Collins, Dudley Hardy, Charles Sainton, and David Green members of the Royal Institute of Painters in Water Colors and Mr. Clausen, Mr. Philip, and Mr. Pilsbury, members of the Old Water Color Society. During the year the Institute of Painters in Oil Colors changed its name to Society of Oil Painters and exhibited in October at the Royal Institute of Painters in Water Colors.

Acquisitions in Great Britain.—The most important acquisitions to the National Gallery were: Millais's "Portrait of Gladstone;" Romney's "Mrs. Mark Currie;" C. P. Knight's "The Kyles of Bute;" Watts's "Portrait of Mr. Russell Gurney;" the shutters to Da Vinci's "Vierge aux Rochers;" a portrait of Mme. Vigée Le Brun, painted by herself, and two fine Rembrandts, bought from the Baroness de Saurmarez. The acquisitions of the National Portrait Gallery were Watts's portraits of "Gladstone" and "Sir Peter Grant," and Collier's "Huxley." The chief acquisition to the Gallery of British Art was Millais's "Order of Release." The National Gallery of Scotland received J. Phillip's "La Gloria" and a gift of £10,000 from Mr. Findlay for external and internal decoration.

Sales in Great Britain.—At the art sales in London the largest sum was given by Mr. Asher Wertheimer for the wonderful Hope collection* of Dutch and Flemish pictures (£121,550). At Christie's the most important sales were the Ruston and Fune-Jones's. Some of the highest prices paid in London for single pictures were Burne-Jones's "Mirror of Venus," 5,450 guineas; "Chant d'Amour," 3,200 guineas; "Love and Pilgrim," 5,500 guineas, and "Fall of Lucifer," 1,000 guineas; Rossetti's "Dante at the Bier of Beatrice," 3,000 guineas; "La Ghirlanda," 3,000 guineas, and "Veronica Veronese," 1,550 guineas; Gainsborough's "Lady Clarges," 1,850 guineas; Rembrandt's "Nicholas Ruts," 5,000 guineas. At the Renton sale of 250 masters, Millais's "Order of Release" brought 5,000 guineas; "Black Brunswicker," 2,650 guineas; "Afternoon Tea," 1,300 guineas; Corot's "La Chevrier," 1,600 guineas; Morland's "Post-Boy's Return," 1,250 guineas; Romney's "Mrs. Crouch," 1,300 guineas; Romney's "Mme. Susan Jouenne," 3,000 guineas; Nattier's "Portrait of the Duchesse de Rohan," 1,100 guineas; Ruben's "Repose of the Holy Family," 1,300 guineas. Christie, Manson and Woods sold a collection of pictures and remaining works of Benjamin West. The works of J. B. Burgess, R. A. and Henry S. Marks, R. A., were sold; also a portrait of "Charlotte Brontë," by John Hunter Thompson, and an early portrait of "Charles Lamb" in profile, by George Dance, R. A., was sold at Foster's, Pall Mall, for £3,125. It was catalogued as C. Lambie. The fresco and distemper pictures from the Oratory of S. Ambrogio, Milan, ascribed to Luini (which had been in England since the early part of this century), were bought for the South Kensington museum. The nine frescoes, the most important of which is "The Last Supper," fetched only £89. 10s.

Exhibitions in Great Britain.—The most notable exhibitions of the year were those of the Royal Academy. The first one was devoted to Sir John Millais. It filled seven galleries, revealing, as a critic said: "The whole of the life's work of the best equipped artist that the English nation has produced." The spring exhibition corresponds to the Paris Salon. It was noticeable for the number of American and Scottish pictures and the striking prevalence of the decorative element. E. A. Abbey's "King Lear," Alma Tadema's "Conversion of Paula by Saint Jerome" (said to be his masterpiece), G. F. Watts's "Love Triumphant," G. H. Boughton's "Road to Camelot," Sargent's "Portrait of Miss Leiter," Herbert Draper's "Lament of Icarus" (purchased for the Chantry collection for £840), Byam Shaw's "Truth," Yeend King's "Milking-Time," Fisher's "Realms of Fancy," Peacock's "Ethel," and Mr.

* Described in Smith's *Catalogue Raisonné*.

Dicksee's pictures were the most admired. Among the important exhibitions was a fine collection of British and Continental paintings at the New Gallery (one room was given to Rosetti), and a collection of paintings and enamels by living French artists, besides a valuable loan collection of Renaissance art objects sent by Signor Bardini of Florence; an exhibition of Australian art at the Grafton Galleries, sent from the art galleries of Sydney, Victoria, and Melbourne, and individual artists; a loan collection of French art at the Guildhall, very rich in Gerômes, held for three months, drawing 206,988 visitors; International Exhibition of Painting and Graving, at the Prince's Club; a Landscape Exhibition at the Dudley Gallery; 84th exhibition of pictures by British and French artists at the French Gallery; an exhibition of International Art at Knightsbridge; an exhibition of miniatures by Pleiner and Englehart; and exhibitions by the Society of Lady Artists; Society of Painters in Water Colors; Fine Arts Society; Society of British Artists; Society of Portrait Painters; Institute of Painters in Water-Colors. Among the important single pictures exhibited were Tuxen's portrait of Queen Victoria attending the Diamond Jubilee, and Dickinson's portrait of General Gordon. Exhibitions of importance held elsewhere in Great Britain were: 37th exhibition of the Royal Glasgow Institute; 28th annual exhibition of the Walker Art Gallery, Liverpool; Whitworth Institute, Manchester; Burlington Fine Arts Club (pictures of Milanese Schools), exhibition of Royal Scottish Society of Painters in Water Colors, National Galleries, Edinburgh; Bristol Academy.

France.—A most important sale took place at Cannes of Fragonard's paintings, which decorated a room in the Maison Malvilain at Grasse. They were sold to an English buyer for £50,000. These were originally painted by Fragonard for Mme. Dubarry's Château of Louveciennes. They were the artist's last important work and are full of amorous gaiety and beautiful effects. There are five: "La Vierge et l'Amour;" "La Surprise;" "Le Sacrifice de la Rose;" "La Lettre d'Amour;" and "La Couronne d'Amour."

French Exhibitions.—Owing to the preparations for the future exposition of 1900, the two rival associations—the Société des Artistes Français ("Les Champs Elysees"), and the Société Nationale des Beaux-Arts ("du Champ de Mars"), exhibited under one roof in the Galerie des Machines. There were 7,593 works. The Artistes Français, in 30 rooms, exhibited 5,024 and the Société Nationale in 18 rooms, 2,569. Of the proceeds, 348,000 francs, two-thirds were allotted to the Artistes Français, and the rest to the Société Nationale. Henner took the medal of honor for his "Levite of Ephraim." The second class medals were given to MM. Bouché, Sinibaldi, Adler, Leroux, Roussel, Guinier, de Wambez, Wagrez, Lazerges, Wéry, Jamin, Sabatte, Mlle. A. Delasalle, Gagneau, Grandjean, Debon, Aviat, Enders, Prevot-Valeri, and Umbrecht. The Société des Artistes Français elected Léon Bonnat President in place of Edouard Detaille; E. Loviat and Fremiét Vice-Presidents; Albert Maignan, A. Bartholdi, Pascal Lamotte, Secretaries; T. Robert Fleury, Secrétaire-Rapporteur; Boisseau, Secrétaire-Trésorier; and Lubet-Bouguereau, Humbert, Collin, Jules Lefebvre, Gabriel Ferrier, Vibert, Corman, Flamerg, Carlier, Leroux and Laloux Consul d'Administration. J. P. Laurens was made President of the section and Jury de Peinture for the Salon of 1898. The French government commissioned A. Valabrègue to make, under the direction of the Beaux-Arts, comprehensive researches regarding French pictures in the galleries of Germany and Holland. The painters decorated with Chevalier of the Legion d'Honneur were Couturier, Gervais Barrias, Jacques Emile Blanche, Boutigny, Brispot, Cesbron Dameron, José Frappa and Rosset-Granger. Carolus Duran was elected President of the Société des Beaux-Arts, in place of Puvis de Chavannes, and he appointed Rodin President of the section of sculpture.

Acquisitions in France.—The Louvre acquired a fine work by Piero della Francesca for 130,000 francs, representing the "Virgin and Child." This formerly belonged to the collection of the Duc de la Trémoille. The Virgin wears an exquisitely painted and transparent veil and the landscape beneath the blue sky is very beautiful. A portrait by Goya was bought in Antwerp for the Louvre, which received as a bequest from Meissonier's widow "La Madonna del Baccio," "Le Chant," two portraits of Meissonier" (1872 and 1899), "La Messe à la Chapelle, de la Vierge Miraculeuse à St. Marc à Venise;" "Soliel couchant dans la Forêt de St. Germain, Ovale à Antibes, Clair de Lune à Venise;" "Cavaliers Louis XIII. en Route;" Jean Jacques descendant la Vieil Escalier de Bois de Lausanne, Samson combattant les Philistines, Les Ruines des Tuileries, Le Siège de Paris." The Luxembourg received a picture by Eugène Burnand, and from M. Haynen the "Jean Baptiste," sometimes called "L'Apparition" by Moreau, representing the apparition of the bleeding head to the daughter of Herodias. Paris received the bequest of Moreau's house in the Rue la Rochefoucauld with its collections and its gallery containing his drawings and pictures. This house contains 700 oils, 300 water-colors and 5,000 drawings. To the Ecole des Beaux-Arts he left 100,000 francs to establish a prize. M. Osiris bought Malmaison to form there a collection of objects relating to Napoleon,

Josephine, the Consulate and the First Empire. The Duc and Duchesse de la Trémoille presented a fine "Holy Family" by Nicolas Poussin.

Sales in France.—The Marmontel and the Goupy sales were among the most important. The Marmontel realized 440,340 francs; "Le Soir," Corot, 21,200 francs; Rousseau's "Maisons au Mont St. Michel," 10,100 francs; Géricault's "Colonel de Hussards," 5,000 francs; Jongkind's "Vue de Hollande," 7,000 francs; Millet's "Tête de Paysanne," 3,500 francs; and a study for "Christ Before Pilate," Munkácsy, 2,500 francs. The second sale realized 99,990 francs. Manet's "Au Jardin," 22,000 francs; Manet's "Alabama," 20,000 francs; Degas's "Avant la Course," 8,200 francs; Monet's "Canal en Hollande," 4,400 francs; and Corot's "Le Pont de Poissy," 3,950 francs.

Other Exhibitions and Acquisitions on the Continent.—The most important exhibition on the continent was the superb exhibition of 123 Rembrandts at Amsterdam during the coronation festivities of Queen Wilhelmina. The Queen of England, the Dukes of Devonshire and Westminster, and the Duke of Saxe-Weimar sent examples. This was afterwards exhibited at the Academy of Fine Arts, Berlin. A loan exhibition of Mediaeval and Renaissance Art in Berlin of paintings, sculpture, bronzes, etc., from private collections, including the Emperor's "Christ Crucified" attributed to Jan Van Eyck; an exhibition of sacred art was held in Turin, the pictures being contributed from Italian collectors and churches. The Madonna and Child predominated. "The Madonna della Tenda" on a panel, attributed to Raphael, was sent by the Barone Ernesto d'Aviso of Turin, and a superb alter-piece by Luigi Donati, belonging to the Bishop of Como, representing "The Nativity" were the most valuable. The International Art Exhibition in Vienna gave eight gold medals to English exhibitors. E. A. Abbey received one for "Hamlet," F. A. Bridgman and Alexander Harrison for Arcadia. Carolus Duran and A. Rodin were also given gold medals. Royal Museum of The Hague bought Rembrandt's "David Before Saul." The Brera Gallery, Milan, acquired a fine "Virgin" enthroned, with the child, accompanied by three saints, by the painter known as Fadino; the Galleries of the Hermitage of St. Petersburg were enriched by the purchase of the collections of the late minister of Foreign Affairs, Prince Lobanof, historical portraits, miniatures and sculptures; numerous pictures by Russian artists were placed in the new museum named for Alexander III; the National Gallery at Berlin was reorganized; the Kunstverein of Düsseldorf (the "Maler-Kastin" of 700 members), celebrated its 50th anniversary; and the Rembrandt Society of Holland spent 29,925 florins on the purchase of paintings which otherwise would have left Holland. International Congress of Public Art met in Brussels in September, and a Congress for Art History in Amsterdam in September-October.

Events in America.—A bill was introduced in Albany allowing cities in New York of the first-class \$50,000 and of the second \$25,000 annually, for art works. The Fine Arts Societies selected T. D. Cauldwell commissioner to the Paris Exposition of 1900. The National Art Club and The Arts Club were incorporated; a Department of Fine Arts connected with the Teachers' College, Columbia University was opened; arrangements were perfected for the removal of the National Academy of Design to Morningside Heights; the Artist Artisan Institute was reorganized; the Society of American Landscape Painters organized a yearly exhibition of their works; the Chicago Art Clubs federated into the Chicago Art Association; and Andrew Carnegie offered to enlarge the Carnegie Galleries, Pittsburg.

Exhibitions.—The Stewart Collection exhibited at the American Art Galleries brought high prices; Fortuny's "The Academicians Choosing a Model" was bought for \$42,000 by W. A. Clark, of Montana, who also bought Fortuny's "Street in Tangiers" for \$5,000; "Gipsy Caves at Grenada," \$2,200, and Madrazo's "Woman with a Parrot," \$3,350. Fortuny's "Fantasia" brought \$12,000; "Arab Butcher," \$2,300; "Portrait of Meissonier," \$2,300; "The Antiquary," \$15,200; "The Court of Justice, Alhambra," \$13,000; "The Arquebusier," \$2,850; "The Café of the Swallows" (water color), \$3,100; Madrazo's "Woman with a Guitar," \$2,500; "Departure from the Masked Ball," \$16,500; "Pierrette," \$5,000; Rousseau's "Woodcutter in Fontainebleau," \$7,450; a Troyon, \$13,700; a Corot, \$6,200; Meissonier's "The Halt," \$12,500, and "The Village Politicians," by Wilhelm Leibl (the head of the German Naturalistic School), \$15,000. At the Fuller sale Gainsborough's Blue Boy, (offered at \$50,000) was withdrawn. Rousseau's "Charcoal Burner's Hut" brought \$36,500; Gainsborough's "Lady Innes," \$5,500; Gainsborough's "The Market Cart," \$1,550; Constable's "Weymouth Bay," \$3,050; "The Lock," \$5,200; and Troyon's "Cows in Pasture," \$22,000. Of Mr. Dana's paintings, Corot's "Danse d'Amours" brought \$36,000; Millet's "Turkey-Herder," \$20,500; Daubigny's "On the River Oise," \$6,500; Courbet's "Seashore," \$3,300; Rousseau's "Harvest Field," \$4,200; and Ziem's "Une fête à Venise," \$3,800. A sale of pictures by William Morris Hunt took place in Boston. Among the paintings brought to this country from the Sedelmayer Galleries, Paris, "Miss Le Nain," by Gainsborough, sold for \$7,500; "Mrs. Barnard," by Sir J. Reynolds, \$5,500; Romney's "Miss Eleanor Gordon," \$8,000; Opie's "Miss

Coxe," \$2,500; Sir M. A. Shee's "Mrs. Norton," \$1,200; Turner's "Lake Thun," \$4,400; Corot's "Lake Nemi," \$4,100; Munkacsy's "Flirtation," \$5,500; E. Charlemont's "Van de Velde," \$7,600; Meissonier's "La Vendetta," \$3,400; and Fortuny's "Spanish Lady," \$300. At the National Academy of Design's 73rd annual exhibition Robert Reid won the Hallgarten prize of \$300 for "Dawn;" Harry Roseland the second prize of \$200 for "An Imported Letter;" and W. C. Harrison the third of \$100 for "Fields in October." A. W. Thayer took the B. Clarke prize of \$300 for a "Portrait of a Young Girl;" and the N. W. Dodge prize of \$300, restricted to women, was given to Miss Letitia B. Hart for "The Keepsake." At the 20th exhibition of the Society of American Artists in the Fine Arts Building, John S. Sargent's portraits, Whistler's "A Note of Carmine;" John W. Alexander's "Peonies;" and Albert Herter's portrait were among the notable works. George R. Barse was awarded the Shaw Fund Prize of \$1,500 for "Night and Day;" and George H. Bogert the Webb prize of \$300 for "Evening, Honfleur." Ten members seceded from the Society of American Artists: Frank W. Benson, William L. Metcalf, Edward Simmons, Joseph Decamp, Thomas W. Dewing, Edmund C. Tarbell, J. Alden Weir, J. H. Twachtman, Childe Hassam and Robert Reid, and calling themselves The Society of Ten, exhibited at Durand-Ruel's. Of great importance was the third annual exhibition at the Carnegie Institute, Pittsburg. Tryon's "Early Spring in New England" received the gold medal and \$1,500; Childe Hassam's "The Sea" a silver medal and \$1,000; and Alexander Roche's "Window-Seat" a bronze medal and \$500. There were excellent examples of modern French, Dutch, German, English, Scottish, Scandinavian, as well as of the American School. Mr. Von Thaulow, Mr. Lavery, Raimundo de Madrazo, Tissot, Carolus Duran, Boutet de Monvel, and Frederick A. Bridgman visited the exhibition. The 67th exhibition of the Pennsylvania Academy of the Fine Arts gave the place of honor to George de Forest Brush's "Mother and Child," J. W. Alexander's "Pot of Basil;" F. A. Bridgman's "End of a Fête Day," and "Women in the Mosque of Algiers;" Mary Cassatt's "A Woman Seated" and "The Toilet;" and Whistler's "A Symphony in Violet and Blue" were among the most admired works. At a loan exhibition of American artists' works, Union League, Winslow Homer's "Light on the Sea" had the place of honor; Homer D. Martin's "Source of the Hudson," Twachtman's "Winter" and Colman's "Dutch Farm" were especially noticed. At the same time the Fifth Avenue Art Galleries exhibited examples of older American artists,—Bierstadt, Inness, Casilear, Wyant, etc. Twenty-five pictures by George Inness and Winslow Homer, lent by Thomas B. Clarke, were shown at the Union League, which had a third exhibition in December at which were seen George Gould's Vandyke's portrait of Count d'Alligre," and pictures by Courbet, Fortuny, Corot, Inness, Rousseau and Troyon. A loan exhibition at the Union League Club of Brooklyn exhibited pictures by Corot, Henner, Diaz, Ziem, Madrazo, Monet, Bouguereau, John Le Farge, Shurtleff, and portraits by Gilbert Stuart. At the Water Color Society's Exhibition at the National Academy of Design, the Evans prize of \$300 was won by C. Harry Eaton for a landscape. There was an interesting Portrait show (Academy of Design) at which were seen Sir J. Reynold's "Strawberry girl," Gainsborough's "Blue Boy;" Whistler's "Girl in White;" Sargent's "Calvin S. Brice," and portraits by Gerôme, Wm. M. Chase, Madrazo, de la Gandara, Boldini, A. Herter, Chartrain, Beckwith, J. Alden Weir, H. S. Mowbray and Cecilia Beaux. Among the minor exhibitions were: Boldini's portraits, including "Verdi," "Whistler," and the "Princess Poniatowski" (the artist being present) at Boussod-Valadon & Co.; Antonio de la Gandara's portraits at the Durand-Ruel Galleries; exhibition of the late Eugène Boudin's works, including "Fair in Brittany" at Durand-Ruel's; twenty-four pictures by Julian Rix shown at Schaus's with Lenbach's portrait of a Dutch girl and Sargent's "Calvin S. Brice;" L. Crist Delmonico exhibited works of the Scandinavian artist, Fritz Thaulow; E. A. Abbey's "Hamlet" at Avery's; Jules Dupre's "Forest of Fontainebleau" at the Chapman Gallery. Tooth exhibited examples of Reynolds, Lawrence and Romney; Gerôme's "Mountain Road in Italy," at Ortgies, and Tissot's pictures illustrating "Life of Christ" at the American Art Galleries. The National League of Mineral Painters exhibited at the Waldorf-Astoria; the St. Louis Museum of Fine Arts, paintings of Arctic regions by Frank W. Stokes; the Society of Western Artists exhibited in the Detroit Museum of Art and at the Art Institute of Chicago; the Chicago Art Institute held a number of exhibitions, among them a loan exhibition of old Masters; the Charleston Art Club held an exhibition; at that of the Buffalo Society of Artists the prize was won by Frank C. Penfold; there was a fine loan exhibition in Washington, D. C., and the 8th annual exhibition of the Society of Washington Artists.

The most valuable acquisitions were to the Mark Hopkins Institute of Art, San Francisco, which received a fine collection of works by famous Eastern and European artists. These were placed on permanent exhibition. A lunette in majolica, supposed to be by one of the Della Robbias, was presented to the Brooklyn Institute of Arts and Sciences, by Mr. Augustus Healy.



JESUS AND HIS MOTHER IN NAZARETH

PAINTING, EXHIBITIONS OF (England). See PAINTING.

PALMER, ARTHUR, LL. D., D. C. L., professor of Latin at Trinity College, Dublin, was born at Guelph, Ontario, September 14, 1841, and died December 14, 1897. He was a well-known editor of Plautus, Ovid, Horace, Catullus, and other Roman writers, and was a recognized authority on classical literature. He was called to the chair of Latin at Trinity in 1880.

PANA, ILLS. See STRIKES AND LOCKOUTS.

PANAMA CANAL. See CANALS (paragraph Ship Canals).

PANAMA, ISTHMUS OF, GEOLOGY OF. A report on this region, which includes portions of Costa Rica gives a summary of the geomorphology, geology, and paleontology of the Isthmian and Central American regions. It shows that the Panama Isthmus is an old land barrier, which has been weathered down to numerous isolated hills, and that topographic evidence proves the present Isthmian land to be a remnant of a formerly much wider area. The rocks composing it are igneous, and sedimentary of late cretaceous, and tertiary age. A barrier is supposed to have existed as far back as jurassic times, but it has not remained continuously up to the present day, and it was the mountain-making disturbances of the late tertiary, which are responsible for the present conspicuous features of Central American and Antillean geography.

PANCREATIC DIGESTION AND GASES. Klug has demonstrated the fact that during pancreatic digestion, gases may be evolved even if the presence of bacteria is absolutely ruled out. Small quantities of carbonic anhydride, and in some cases hydrogen also, are formed when bacterial action is excluded by disinfectants like thymol. It, however, only takes place when fat is the substance acted on; it does not occur with glycerol; hence the gases are considered to originate from the decomposition of the fatty acid radicals.

PANIZZARDI, LIEUT.-COL. See FRANCE.

PAPYRI. See ARCHÆOLOGY (paragraph Egypt).

PARAGUAY, an interior republic of South America between Brazil and Argentina, comprises twenty-three *partidos*, or counties, having an aggregate area of about 98,000 square miles. The estimated population in 1897 was about 600,000 whites and about 60,000 civilized and 70,000 uncivilized Indians. The population of the country seems to have fluctuated greatly. According to official estimates, there were in 1857, 1,337,439 inhabitants; and in 1873, 222,079; the imperfect census of 1887 placed the white population at 329,645; the estimate of 1895 was 432,000. In 1887 the foreign inhabitants numbered about 9,340, of whom 5,000 were Argentines, and 2,000 Italians. The capital is Asuncion (pop. in 1895, 45,000); the other more important towns are Villa Rica (19,000), Concepcion (10,000), San Pedro, and Luque (each 8,000).

Government.—The constitution of Paraguay, modelled upon that of Argentina, was adopted in 1870 after the close of the war in which Paraguay was defeated by the combined forces of Brazil, Argentina, and Uruguay. The executive authority is vested in a President, elected for a term of four years, who exercises his functions through a ministry of five members appointed by himself and responsible to Congress; the five departments are Finance, Foreign Affairs, War, Worship and Justice, and the Interior. The President (1894-98) is General Don Juan B. Egusquiza. The legislative power devolves upon a Congress consisting of a Senate and a Chamber of Deputies; members of both houses are chosen by direct vote of the people, the Senators in a proportion of one to 12,000 inhabitants, and the Deputies one to 6,000; in the more thickly populated districts, however, a greater ratio may be allowed. The government of the *partidos* is administered by chiefs and justices of the peace, who receive the assistance of municipal councils. Justice is maintained through local magistrates, various inferior courts, and a High Court of Justice.

Finance.—The following are the official figures in pesos for revenue and expenditure for fiscal years:

	1893.	1894.	1895.
Revenue	5,777,899	4,910,472	5,120,248
Expenditure	5,852,720	5,357,498	4,992,007
	1896.		1897.
Revenue	5,100,496	est.	5,462,475
Expenditure		est.	5,462,475

The chief sources of revenue are customs, stamps, sale of land, etc. The outstanding public debt in 1897 was \$4,840,780.

Army and Navy.—The army, consisting of infantry, cavalry, and artillery, numbers about 1,430 officers and men, and is used in maintaining order. Citizens be-

tween twenty and thirty-five years of age are liable to military service. Paraguay has one steamer of 440 tons and two smaller steamers.

Industries and Commerce.—The soil of the country is fertile and there are excellent grazing lands, valuable forests, and minerals which are unworked. Most tropical and sub-tropical products may be successfully cultivated; manufactures have made very little progress, though in the vicinity of Asuncion there are several tanneries, breweries, factories for soap, matches, earthenware, palm-leaf hats, etc.; throughout the country there are distilleries for caña, or white rum. The most important industry is the cultivation of yerba maté (*Ilex Paraguensis*, Paraguay tea). The leaf exported in 1896 amounted to 9,024 tons, valued at over \$1,400,000. The maté fields, which were formerly owned by the State, are now in the possession of private and corporate owners. Other important products are timber, tobacco, and oranges; of the last named product, there is an annual exportation of 6,000 to 7,000 tons to Montevideo and Buenos Ayres. To further the development of the great agricultural resources, the government encourages immigration. Copper, pyrites, and kaolin are found, and iron is abundant in the northern part of the country and marble in the south. Foreign trade has been as follows:

	1893.	1894.
Imports (gold pesos).....	2,533,298	2,222,202
Exports (paper pesos).....	7,999,845	11,100,597
	1895.	1896.
Imports (gold pesos).....	2,462,050	2,786,000
Exports (paper pesos).....	12,728,627	12,292,000

Nearly half of the imports came from Great Britain. The chief imports are textiles, rice, and wines; the chief exports are Paraguay tea, hides and skins, tobacco, and timber.

Communications.—Transportation in Paraguay is difficult as the roads are little better than paths. Although the first railroad in South America was built in Paraguay by Dictator Carlos Antonio Lopez about fifty years ago, the country has only one line at present; it is owned by a private corporation and connects Asuncion with Pirapo, 156 miles distant. It is likely that this road will be extended to Encarnación, so as to connect with the Argentine railway system at the Paraná river. Three lines of steamers make regular trips between Asuncion and Buenos Ayres, a distance of 1,100 to 1,200 miles. In 1898 there were 360 miles of telegraph lines. Paraguay has been in the postal union since 1881 and in 1896 had 95 post-offices. In 1896 there entered at Asuncion from foreign ports 666 vessels aggregating 176,638 tons, and cleared for abroad 613 vessels of 147,640 tons.

Religion and Education.—The State religion is Roman Catholic, but there is no interference with other forms of faith. In 1887, of the adult Paraguayans 20 per cent. could read and write, and of the adult foreigners, 60 per cent. At present, education is free and compulsory. In 1896 the elementary schools, both public and private, numbered 358, having 680 teachers and 23,000 pupils. The National College at Asuncion has fifteen professors and 205 students; there are also at Asuncion a public library and five newspapers. Besides providing for the public schools, the government grants small subsidies to the private ones.

Money.—There are several banks, one of which is reported to have a capital of 4,250,000 pesos. Paraguay has no gold or silver coin of its own stamping; the silver peso of other South American countries is in circulation, and has the same value as in the countries that issue it. On October 1, 1898, the Uruguayan peso was worth \$1.034 United States currency, and that of Argentina, \$0.965. Paraguayan paper money is the chief circulating medium; the amount in circulation is about 6,301,800 pesos. The gold value, in United States money, of the paper peso is only about 13 cents.

The President's Message.—On April 1, 1898, President Don Juan B. Egusquiza delivered a message to the Congress on the opening of the session; the following are some of the more important topics upon which he touched. In regard to education he spoke with some satisfaction, reporting the enlargement of the normal school system, which is co-educational with at that time more than 1,000 pupils. Instruction, agriculture, art, and science had been extended and a corps of foreign teachers engaged. The postal and telegraph services had developed; telegraph lines, which had already been extended beyond San Pedro, were to be sent forward from Asunción to Villa Concepción, and a proposal had been made to extend a line to Fuerte Olimpo and to construct various branch lines. The Agricultural Bank, an important government institution, had given great encouragement toward the development of cotton, coffee, grape, tobacco, and other agricultural industries. At the time of the

message there were more than 1,000,000 coffee trees in the country with the prospect of two or three times this number before 1900. Largely under the influence of the Agricultural Bank, which has entire charge of the farming interests in the country, agriculture has received a stimulus and many of the inhabitants are enthusiastic in taking up agricultural pursuits; in order to facilitate this the government has granted small subsidies. In regard to the National Bank President Egusquiza stated that liquidation still continued but that the debtors were slow in making their payments. It was expected that the land tax would become a source of considerable national revenue. The imports for the year preceding April 1, aggregated \$2,203,359 (gold), and the exports \$1,555,803 (gold). The government was considering a proposal to build a railroad from those districts where the yerba maté flourishes. This was considered a very important enterprise as it would increase the trade in yerba maté which is already consumed in great quantities by the inhabitants of Paraguay and of the neighboring States. The President was pleased to report the peaceful relations which existed between Paraguay and contiguous countries, the only unsettled foreign question of any considerable importance being that of the Bolivian boundary line in the territory of the Chaco. The Chaco is an immense wilderness, and it is not at all likely that any serious difficulty will arise in settling the question. The President finally expressed his belief in the wisdom of making treaties of commerce with the neighboring countries and in the adoption of a liberal and friendly policy toward them.

PARIS EXPOSITION. See articles ASTRONOMICAL PROGRESS and FRANCE.

PARKS, PARKWAYS AND PLAYGROUNDS. There has been a wholesale awakening, of late, to the value of breathing spaces for crowded cities. Perhaps the most extended developments of parks and parkways now in progress in the United States are the Metropolitan Park System for Boston and nearby towns and cities and the Essex County Park System, in New Jersey. At the beginning of 1898 the Metropolitan System included eight parks, ranging from 24 to 4,232 acres in area and aggregating 8,090 acres, including 1,200 acres owned by various water boards; some ten miles of parkway; and an immense ocean bathing establishment (see MUNICIPAL BATHS). A total of \$6,820,000 had been appropriated for the use of the commission to the close of 1897. Besides these large park areas many of the individual towns and cities have extended parks, Boston alone owning 2,271 acres of parks and parkways on January 31, 1898, which had cost \$6,491,000 for land and \$8,172,000 for construction, making a total of \$14,663,000. Greater New York has some 7,000 acres of parks and playgrounds. The Essex County Park System included some 2,500 acres at the close of 1898, with many miles of parkways projected and a little work done on them. A feature of all the park systems particularly named above is the providing of large reservations to be left as nearly as possible in their natural state. Boston has provided numerous small playgrounds and some are under way in New York City. They are needed for the every-day use of children and others who cannot get to the larger parks, often at some distance, and are especially needed to give the children of crowded quarters some outdoor place for recreation aside from the streets. New York City has done a unique thing in providing recreation piers on the river fronts for its most crowded sections. These may best be described as second stories, with canopy roofs, to the regular shipping piers. They have been built by the Dock Department, on the East river and North river, in Manhattan Borough. They are free to the public and are open both in the daytime and evening during warm weather. Music is provided at certain hours, at least at some of them, and dancing is permitted and indulged in to a large extent.

PARNELL, MRS. DELIA TUDOR STEWART, mother of the late Irish Nationalist leader, Charles Stewart Parnell, died at Avondale, county Wicklaw, Ireland, March 27, 1898. She was born in New Jersey in 1815. She was for many years a prominent figure in Irish politics in the United States.

PAROS. See ARCHÆOLOGY (paragraph Greece).

PARTHENOGENESIS IN PLANTS. See BOTANY (paragraph Plant Physiology).

PATENT STATISTICS. According to the reports of the United States Patent Office there were issued during the calendar year of 1898 a total of 22,267 new or re-issued patents. The number of applications filed was 35,842; of caveats filed, 1,650; amount of cash received, \$1,137,734; of cash expended, \$1,136,196; surplus, \$1,538. In 1897 the new and reissued patents numbered 23,794; the applications filed, 47,905; the caveats filed, 2,176; the cash received was \$1,375,641; the cash expended, \$1,122,843; and the surplus, \$252,798. The number of applications, caveats filed, etc., for the calendar years 1890 to 1896 inclusive, are as follows: ●

Statistics of the United States Patent-Office.

Calendar Year.	Appli- cations.	Caveats Filed.	Patents and Reissues.	Cash Received.	Cash Expended.	Surplus.
1890....	41,048	2,311	26,292	\$1,340,372	\$1,082,576	\$257,796
1891....	40,542	2,408	23,244	1,271,285	1,139,713	131,572
1892....	40,753	2,290	23,559	1,286,331	1,110,731	175,600
1893....	38,473	2,247	23,769	1,242,871	1,141,038	101,833
1894	38,439	2,286	20,867	1,187,439	1,100,047	87,392
1895	40,680	2,415	22,057	1,245,246	1,106,389	138,857
1896....	43,982	2,271	23,373	1,324,059	1,113,414	210,645

The number of British patents issued in the same years (1890 to 1896, inclusive) was:

1890	10,646
1891	10,643
1892	11,154
1893	11,530
1894	11,699
1895	12,191
1896	12,473

PATY DE CLAM, Lieutenant-Colonel **MERCIER DU**, has been identified with the Dreyfus case from the first. He was employed in 1894 by the War Office to conduct the investigation, and after the arrest of Dreyfus, he did his best by intimidation and deceit to make him confess his guilt. It is said that he was one of the most important witnesses against Dreyfus in the trial. At the Esterhazy court martial he repeated his belief in the guilt of Dreyfus. He was the man whom Zola specified in his "I accuse" letter as the "diabolical workman of the judicial error." Zola said that his mind was haunted by romantic intrigues, that he was mixed up in affairs involving stolen documents, anonymous letters, mysterious women, etc., and accused him of having tried to terrorize Mme. Dreyfus, and of having resorted to the most preposterous means for establishing the guilt of an innocent man. The affair of the mysterious "veiled lady" to whom Esterhazy referred in the course of his trial, is said to have been due to the invention of Paty de Clam. He tried also, to entrap Colonel Picquart after the latter had been sent to Tunis, and was the reputed author of certain ambiguous telegrams which were meant to make Picquart the object of suspicion. Colonel Picquart brought an action against him on account of these telegrams, and finally, on September 12, it was officially reported that Paty de Clam had been dismissed from his post on account of his connection with the Esterhazy case.

PAVEMENTS AND ROADS. The use of asphalt paving is rapidly extending in many cities throughout the country, especially since the recent reduction in its cost of construction. It has several advantages over other paving materials, such as smoothness, cleanliness, noiselessness, imperviousness, and small resistance to traction. Brick paving is being used very extensively, especially in Western cities and near brick producing centres. Wood pavements are far less in vogue than formerly, but this is partly due to improper material and workmanship in the past. In England, wood pavements are being used quite largely, hard woods from Australia being in favor for that purpose. The importance of proper foundations for all classes of pavements is better recognized now than ever before, 6 to 8 inches of concrete commonly being used for that purpose. For heavy traffic, Belgian block, or small granite blocks of uniform size, are largely used. Cobble stone is no longer admissible as a paving material. Much paving work, more especially asphalt, is laid under a guarantee from the contractors to keep it in repair from 5 to 15 years. This practice is deemed essential, partly because the mixing and laying of asphalt so as to give satisfactory results has not yet been reduced to as scientific a basis as most other phases of municipal engineering, and partly because asphalt is largely, and in the past has been almost absolutely a monopoly product. Buffalo and Washington have the reputation of leading in their proportion of asphalt-paved streets.

For light traffic in the outskirts of large cities, in small cities and towns and for country roads, macadam, or broken stone, is extensively used, and with great satisfaction. The surface being finished with fine screenings is very smooth, most admirable for pleasure driving and cycling. Especial pains must be taken to build such roads so that they will be well drained, to avoid dampness caused by heavy shade or excessive street sprinkling, and to prevent (by proper repairs and the use of wide tires) the formation of ruts; otherwise such roads do not wear well. They are rather expensive to keep in repair in any case, but their first cost is low.

Hundreds of miles of macadam and gravel roads have been built in various States during the past few years, partly with State funds, as a result of the Good Roads movement. Massachusetts and New Jersey are far in the lead in this respect. Rhode Island, Connecticut, New York and Pennsylvania have done something. The United States government, through a branch of the Department of Agriculture is doing much to enlighten and stimulate the people of rural districts regarding the value of good roads. It has built some short stretches of improved roads as object lessons.

The Higsbie-Armstrong act, passed by the New York legislature in 1898, provides that the initiative, where State aid is desired, may be taken by the abutting property owners or the county. If the State Engineer endorses the proposed improvement and makes a plan for it satisfactory to the county board, the contract is let, the final cost being divided as follows: State, 50 per cent.; county, 35 per cent.; town, 15 per cent., except when abutting property-owners petitioned for the road, in which case the 15 per cent. falls on them. The expense of maintenance must be met by the town. In New York and other States efforts have been made to establish bicycle paths and in other ways provide for the convenience of bicyclists. See the articles *BICYCLE PATHS* and *OHIO*.

PAYN, JAMES, English novelist and journalist, died March 25, 1898. He was born at Cheltenham, England, 1830; was graduated from Cambridge, 1854; published two volumes of poems and contributed to magazines; became editor of *Chamber's Journal*, 1858. From 1882 to 1896 was editor of the *Cornhill Magazine*. Among his best known novels are *Fallen Fortunes*, *Cecil's Tryst*, *Less Black than We're Painted*, *By Proxy*, *What He Cost Her*, *A Grape from a Thorn*, *Gleams of Memory*. (1894), *In Market Overt* (1895).

PEABODY MUSEUM. See *ANTHROPOLOGY*.

PEARSON, JOHN LOUGHBOROUGH, R. A., prominent English architect, was born in 1816; died December 10, 1897. He built Holy Trinity Church, Westminster; made additions to the University Library and to Sidney Sussex College, Cambridge; and restored the west side of Westminster Hall. In 1874 he became an A. R. A., and an R. A. six years later. Mr. Pearson was a fellow of the Society of Antiquaries and of the Royal Institute of British Architects; he was architect for the cathedrals of Truro, Lincoln, Bristol, Exeter, Peterborough, and Rochester; for St. George's Chapel, Windsor; and, since the death of Sir John Gilbert, for Westminster Abbey.

PEARY, ROBERT EDWIN, civil engineer, U. S. N., with relative rank of lieutenant, was born at Cresson Springs, Pennsylvania, May 6, 1856. He was graduated at Bowdoin College in 1877, and in November 1881, was commissioned as civil engineer in the United States Navy, receiving this appointment after a competitive examination of over two hundred applicants for the four vacancies. In 1885 and 1886 he was assistant engineer on the government surveys for the Nicaragua Ship Canal; in the latter year he made a reconnoissance of the inland ice of Greenland. The next year he became sub-chief engineer for the Nicaragua Canal Company; in 1888-91 he was engaged in superintending engineering work in dry dock. His first expedition to the far north of Greenland was made in 1891-92 for the purpose of determining the insularity of Greenland. Mr. Peary's second expedition to North Greenland was in 1893-95; he went in the steam sealer *Falcon* to Inglefield Gulf and established his headquarters at Anniversary Lodge, at the head of Bowdoin bay. In March 1894, he set out on his second attempt to cross the inland ice to the northeast, but a storm of unprecedented severity and the breaking out of the plague among his dogs, necessitated his retreat after an advance of about 120 miles. Nearly all the members of his party returned on the *Falcon* in September 1894, but Mr. Peary, with Hugh Lee and Mat Henson, remained for a second winter and another attempt to cross Greenland. This effort, in the summer of 1895, was successful, but accomplished under great disadvantage, the three men narrowly escaping starvation. Mr. Peary discovered near Cape York the largest known meteorites in the world, one of them weighing about one hundred tons. Returning to the United States in 1895, he brought with him two meteoric specimens. He was then stationed at the New York Navy Yard in the regular line of his duty. In 1896 and 1897 he made summer voyages to Greenland. In 1896 he made a sixth voyage for the purpose of securing the one hundred-ton meteorite, but was prevented by the ice from bringing it away. In 1897 the American Geographical Society bestowed on Mr. Peary the Cullum gold medal, its first award, for his discoveries in Greenland, and formerly approved his project for an expedition to the Pole. A five years' leave of absence was given him by the Navy Department for the prosecution of the expedition. He made a preliminary voyage to Greenland in the summer of 1897, and the hundred-ton Cape York meteorite, together with six natives, was brought to New York. In the summer of 1898, he published *Northward over the Great Ice* (2 vols.), in which he described his journeys of 1888, 1892, 1894, 1895. In the summer of 1898 he sailed once more

for Greenland, hoping to reach the Pole. For a description of the expedition and route proposed, see ARCTIC EXPLORATION. Mr. Peary is a member of the American Society of Civil Engineers and the American Geographical Society, and an honorary and corresponding member of various geographical societies.

PEASE, ARTHUR, Liberal Unionist, Member of Parliament, died August 27, 1898. He was born at Darlington, England, September 12, 1837, and was educated privately. He was Mayor of Darlington, 1873-74; Liberal M. P. for Whitby, 1880-85; he contested the Whitby Division in 1885 and Darlington in 1892, as a Liberal Unionist. In 1893 he was a member of the Royal Commission on Opium. He was a justice of the peace for county Durham and North Riding, York. From 1895 to the time of his death he was a Liberal Unionist member from Darlington. He was president of the British and Foreign anti-Slavery Society.

PECK, FERDINAND W., of Chicago, Ill., was appointed by President McKinley July 22, 1898, to succeed Moses P. Handy, deceased, as United States Commissioner-General to the Paris Exposition of 1900. He was born in Chicago in 1848; was graduated at the old University of Chicago and the Union College of Law; though admitted to the bar, he did not practice, but directed his attention to the care of the estate left by his father and to the improvement of the social and commercial conditions of his city. Mr. Peck was a member of the commission of five which went abroad in the interests of the Columbian Exposition, and was chairman of its finance committee.

PECK, JAMES INGRAHAM, Ph. D., assistant professor of biology in Williams College, died at Williamstown, November 4, 1898. He was born in Ontario county, New York, August 10, 1863; was graduated at Williams in 1887; entered the department of biology there as assistant in 1892, and two years later was made assistant professor. He published a number of essays on biological subjects.

PEET, ISAAC LEWIS, LL. D., a well known instructor of the deaf and dumb, died in New York City on December 28, 1898. He was born on December 4, 1824, at Hartford, Conn., where his father was a teacher in the American School for the Deaf; and graduated at Yale College in 1845. He then became a professor in the New York Institution for the Instruction of the Deaf and Dumb, where his father was principal and where, upon the retirement of his father in 1867, he became principal himself, holding that office for twenty-five years. He was very successful in his work and wrote several important treatises. Among his works may be mentioned, *A Monograph on Decimal Fractions*; *Language Lessons for the Deaf and Dumb*; *A Manual of Vegetable Physiology*; and an inaugural address entitled *The Psychical Status and Criminal Responsibility of the Uneducated Deaf Mute*, the last named in 1886.

PELLIEUX, General DE, a member of the general staff, and an important witness in the Dreyfus case. He made an extraordinary speech in proof of the guilt of Dreyfus (see FRANCE, paragraphs on History) in which reference was for the first time made to that third document which afterwards proved to be a forgery. After the death of Colonel Henry, General de Pellieux wrote a letter disclaiming any responsibility for that occurrence. The discovery of the forgery led him to demand a revision of the Dreyfus case, and he resigned from the headquarters staff.

PEMBERTON, MAX, author, born in Birmingham, England, June 19, 1863. He was educated at the Merchant Taylor's School and at Caius College Cambridge, joined the staff of *Vanity Fair* in 1885, and became editor of *Cassell's Magazine* in 1896. His first book to attract attention was *The Impregnable City* (1895), which was followed by *The Little Huguenot* (1895); *A Puritan's Wife* (1896); *A Gentleman's Gentleman* (1896); *Christine of the Hills* (1897); *Queen of the Jesters* (1897); *Kronstadt* (1898), and *The Phantom Army* (1898).

PENNSYLVANIA, a middle State of the Atlantic slope in the United States, with an area of 45,215 square miles. Capital, Harrisburg.

Mineralogy.—In 1897 the anthracite coal area was 480 square miles and the bituminous 9,000 square miles. In the production of each kind of coal the State maintained first rank. The anthracite output was 52,431,763 short tons, valued at \$79,129,126, a decrease in a year of 1,914,318 tons; and the bituminous was 54,597,891 short tons, valued at \$37,636,347. The combined product of both kinds was 53 per cent. of the total output of the country. There were 575 mines in operation, employing 77,599 persons, and during the year strikes occurred in 188 mines, affecting 29,112 operatives. (See COAL.) The petroleum production was 17,982,911 barrels, valued at \$14,295,825, against 19,379,201 barrels, valued at \$22,982,402, in 1896. Of natural lubricating petroleum the wells at Franklin yielded 48,880 barrels; for a number of years the yield averaged 50,000 barrels per annum. With an approximate value of \$6,242,543, the supply of natural gas showed a gain over that of the two previous years, but a marked decline from that of other preceding years. The State ranked first in the value of limestone, slate, and all quarry products, and second in sandstone. The out-

puts were: slate, \$2,365,299; limestone, \$2,327,870; sandstone, \$380,813; granite, \$349,947; and marble, \$62,683—total, \$5,486,612. In iron ores the State ranked fourth in total production (723,742 long tons) and first in that of magnetite (441,556 long tons, the highest output of the State on record), the total value being \$851,079. With the exception of 1893 and 1894, the total output was less than that of any year in the previous 20 years. Salt yielded 164,287 barrels, worth \$45,107. In 1898 a vein of ferro-manganese ore was discovered in Jefferson county, which bade fair to result in the opening of a new and very important field in the mining industry of the State. For the clay and cement industries, see the paragraph on Manufactures.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 45,190,135 bushels, value \$18,076,054; wheat, 26,609,940, \$18,094,759; oats, 27,098,902, \$8,129,671; barley, 171,283, \$75,365; rye, 4,447,094, \$2,090,134; buckwheat, 4,085,499, \$1,797,620; potatoes, 9,311,814, \$5,400,852; and hay, 3,784,019 tons, \$29,893,750—total value, \$83,558,205. The State ranked first in the production of rye and buckwheat. Live-stock comprised, horses, 548,747; mules, 37,053; milch cows, 924,260; other cattle, 528,942; sheep, 790,604; and swine, 1,043,331—total head, 3,872,937.

Manufactures.—The State is exceeded only by Ohio in the combined value of its clay-working industries, and ranks first in the production of fire brick. During 1897 the output of 567 plants was valued at \$7,874,695, of which \$7,171,296 represented brick and tile and \$703,399 general pottery. The State also ranked first in the output of Portland cement, with 1,579,724 barrels, from 7 plants, value \$2,369,586. In the coking industry there were 153 plants with a total of 26,910 ovens. The consumption of coal was reported at 13,538,646 tons, the production of coke at 8,966,924 tons, and the value at \$13,727,966; but these amounts are for Pennsylvania and New York together. In the fiscal year ending June 30, 1898, the taxable manufactures of the State yielded the federal government \$13,846,790 in internal revenue. Tobacco had an output of 1,226,762,144 cigars, 2,868,780 cigarettes, 2,965,113 pounds of smoking and 3,783,178 pounds of snuff; distilled spirits, 4,838,837 gallons, nearly all rye whiskey; and fermented liquors, 4,245,864 barrels. A noteworthy feature of 1898 was an extraordinary development of the iron and steel interests of the western part of the State and of naval mercantile shipbuilding on the Delaware river.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise at Philadelphia, Erie, and Pittsburg, aggregated in value \$32,076,329; exports, \$56,248,127; a decrease in a year of \$17,957,931 in imports and an increase of \$8,926,981 in exports. The movement of gold and silver was, imports, \$733,763; exports, \$2,415; making the total foreign trade of the year \$89,060,634.

Transportation.—On Jan. 1, 1898, the direct length of the various railroads was 9,965.49 miles, of which 166.83 miles were constructed during the previous year. The State continued to hold second place in railroad mileage, with Texas a close third.

Banks.—On Oct. 31, 1898, there were 428 national banks in operation and 73 in liquidation. The active capital was \$73,900,430; circulation, \$33,037,559; deposits, \$311,682,613; reserve, \$90,913,497; resources, \$479,421,034. The State banks, Nov. 16, 1897, numbered 90, and had aggregate capital, \$9,199,985; deposits, \$49,056,871; resources, \$67,692,258; surplus and profits, \$7,272,021; loan and trust companies, 89, with capital, \$37,380,974; deposits, \$107,781,343; resources, \$220,301,105; surplus and profits, \$25,358,895; mutual savings banks, 16, with depositors, 307,309; deposits, \$82,245,532; resources, \$92,819,643; surplus and profits, \$10,554,997; and private banks (June 30, 1898), 32, with capital, \$1,706,848; deposits, \$8,827,734; resources, \$11,062,248. The total banking capital was \$122,188,237; all banks held an aggregate of \$559,594,093 in deposits, and had \$871,296,288 in resources. The exchanges at the clearing houses at Philadelphia and Pittsburg in the year ending Sept. 30, 1898, aggregated \$4,627,512,066, an increase in a year of \$769,507,961.

Building and Loan Associations.—A report in 1897 covering 1,131 associations, showed shares outstanding, 1,796,311; dues, paid-up stock, and profits, \$97,077,776; loans, \$90,151,526; and total assets, \$99,519,918.

Education.—At the close of the school-year 1896-7 the public school enrollment was 1,139,765; attendance, 837,071; number of school districts, 2,482; school houses, 14,620; and teachers, 27,429. Public school property was valued at \$48,917,003, and expenditures were \$19,618,187, including \$10,049,812 for teachers' salaries. For higher education there were 251 public high schools; 137 private secondary schools; 14 public and 8 private normal schools; 32 colleges and universities, co-educational and for men only, with 632 professors and instructors, 8,220 students, and \$1,585,198 income; 9 colleges for women, with 180 instructors, 1,108 students, and \$260,868 income; and 15 theological, 3 law, and 6 medical schools. The State Agricultural College at College Station endowed by Congress, received from the federal government \$22,000 in 1897 and \$23,000 in 1898. The colleges, universities, and professional schools had a total of 874,263 bound volumes in their libraries, and the normal and

high schools, 312,665, in all, 1,186,928. In 1898 there were 1,430 periodicals, of which 196 were dailies, 915 weeklies, and 235 monthlies. *The Saturday Evening Post*, founded by Benjamin Franklin in 1728, was still being published, though in greatly changed form.

Public Charities.—From the legislative appropriation for the biennial term ending June 1, 1899, there were paid in the fiscal year ending Nov. 30, 1897, to charitable institutions, \$1,226,787; hospitals and asylums for the insane, \$587,554; penitentiaries, \$105,788; reformatories, \$166,358.

Finances.—The assessed valuations in 1897 were: real estate, \$2,531,568.640; personal, \$826,134,137—total, \$3,357,702,777. During the fiscal year ending Nov. 30, 1898, the revenue of the State was \$13,325,120; expenditure, \$13,973,803. The public debt at the end of that year was \$6,815,299, against which sinking funds held \$5,789,317, making the net debt \$1,025,982, no part of which can be paid till 1912. The financial condition of Pennsylvania gathered from the last reports of the State Treasurer and Auditor General, is as follows. Nearly one-half of the whole revenue goes to the support of the public schools. The State judiciary costs from \$750,000 to \$1,000,000 and the National Guard about \$500,000 a year. For the two years covered by the report, the State prisons cost about \$560,000 and the Department of Agriculture \$90,000 a year. The State Banking Department absorbs \$70,000 yearly and since Nov. 30, 1896, the care and maintenance of the public buildings and grounds at the State Capitol have cost \$200,000 a year. The State gets its largest annual income from the tax on the capital stock of corporations, limited partnerships, etc., which brings in about \$4,000,000. Those corporations, exclusive of State banks and foreign insurance companies that do business in Pennsylvania, pay the State more than \$750,000 a year. The income from foreign insurance companies amounts to \$650,000. The State banks and trust companies contribute some \$575,000. The Pennsylvania Railroad Company alone pays directly \$600,000, and indirectly, through corporations that it controls, about \$1,000,000.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 6,060,000. Local censuses and estimates gave Philadelphia, 1,350,000; Pittsburg, 315,000; Allegheny, 125,000; Scranton, 95,000; Erie, Harrisburg, and Reading, each, 60,000; Wilkesbarre, 55,000; Lancaster, 38,104; Chester, 34,035; Williamsport, 31,000; Hazleton, 20,829; Braddock, 13,000; Sunbury and Carlisle, each, 9,000; Freeland, 7,800; Warren, 7,582.

The Lattimer Riot.—Sheriff Martin and his deputies charged with killing the strikers at Lattimer, Penn., Sept. 10, 1897, were acquitted March 9, 1898. Austria claimed indemnity for the families of some of the victims, who were subjects, but the claim was disallowed.

Wanamaker's Campaign.—Pennsylvania's politics in 1898 were stirred by Mr. John Wanamaker's vigorous campaign against Senator Matthew S. Quay and the corruptionists of the Republican party, in order to secure the nomination of an anti-machine Republican for Governor. He went all through the State and delivered sixty-seven speeches. His principal text was: "The Republican party, as at present constituted, is a most dangerous political trust, composed of two National Senators and twenty-Congressmen, and the large majority of two hundred and fifty-four State legislators at Harrisburg, who, by dictation, dispose of public moneys, and choose administrators of them to the detriment of the public welfare." His specific charges were: that Congressmen have made it a custom to sell postmasterships; that legislators travel on passes and get them for their families and friends, and also act as purveyors for their influential constituents, notwithstanding the constitutional provision forbidding the issuing of passes, and although each legislator receives mileage at the rate of twenty cents a mile. He also charged that the payments of appropriations have been delayed to suit the convenience of the banks; and that the system of keeping millions of dollars of State funds on deposit with favored banks, without interest, was maintained directly by and for the political machine. He also exposed the methods of the lobby and the machinations by which the legislature was corrupted by trusts and corporations. At the State convention Mr. Wanamaker's faction was defeated by a majority of 36 out of 360.

The November Elections.—National, State, and local politics became inextricably mixed in the election. Some reform Republicans thought that the surest way to defeat Colonel William A. Stone, the machine's candidate for Governor, was to vote for Mr. Jenks, the Democratic candidate. Others voted for Dr. Swallow, the Prohibitionist and Independent candidate, in fear of their party being demoralized by the return of a Democrat. The result was that Col. Stone won by a plurality of 117,906; Jenks polling 358,300, and Swallow 127,804.

The Indictment of Senator Quay.—In consequence of specific charges brought against them, Senator Quay, his son Richard, and ex-Treasurer Haywood on Oct. 12, 1898, were indicted by the Grand Jury and charged with others with the fraudulent use of State moneys deposited in the People's Bank of Philadelphia. In consequence

of this and the above-described divisions in the Republican party, there was a long and bitter struggle over Mr. Quay's reelection to the United States Senate.

National Representatives and State Officers.—Pennsylvania's Representatives are: Galusha A. Grow (Rep.), from Glenwood; Samuel A. Davenport (Rep.), from Erie; Henry H. Bingham (Rep.), from Philadelphia; Robert Adams, Jr. (Rep.), from Philadelphia; William McAleer (Dem.), from Philadelphia; James R. Young (Rep.), from Philadelphia; Alfred C. Harmer (Rep.), from Philadelphia; Thomas S. Butler (Rep.), from West Chester; Irving P. Wanger (Rep.), from Norristown; David H. Barber (Dem.), from Mauch Chunk; Daniel Ermentrout (Dem.), from Reading; Marriott Brosius (Rep.), from Lancaster; William Connell (Rep.), from Scranton; S. W. Davenport (Dem.), from Plymouth; James W. Ryan (Dem.), from Pottsville; M. E. Olmstead (Rep.), from Harrisburg; Frederick C. Wright (Rep.), from Susquehanna; Horace B. Packer (Rep.), from Wellsboro; R. K. Polk (Dem.), from Danville; T. M. Mahon (Rep.) from Chambersburg; Edward Ziegler (Dem.), from York; Joseph E. Thropp (Rep.), from Bedford; Summers M. Jack (Rep.), from Indiana; John Dalzell (Rep.), from Pittsburgh; William H. Graham (Rep.), from Allegheny; Ernest F. Acheson (Rep.), from Washington; Joseph B. Showalter (Rep.), from Chicora; Athelston Gaston (Dem.), from Meadville; Joseph C. Sibley (Dem.), from Franklin; and James K. P. Hall (Dem.), from Ridgway. Senators: Boies Penrose (Rep.), from Philadelphia; and a Republican. The State officers are: William A. Stone, Governor; J. P. S. Gobin, Lieutenant-Governor; David Martin, Secretary; James S. Beacon, Treasurer; L. G. McCauley, Auditor; Thomas J. Stewart, Adjutant-General; Henry C. McCormick, Attorney-General; N. C. Shaeffer, Superintendent of Education; James H. Lambert, Insurance Commissioner; and B. F. Gilkeson, Commissioner of Banking. All are Republicans except Schaeffer (Dem.). Chief Justice, James P. Sterrett (Rep.); Associates, Henry Green (Rep.), Henry W. Williams (Rep.), James T. Mitchell (Rep.), J. B. McCullom (Dem.), John Dean (Rep.), and D. Newlin Fall (Rep.). The State legislature consists of 164 Republicans, 84 Democrats, and 6 Fusionists.

PENNSYLVANIA ACADEMY OF FINE ARTS. See PAINTING (paragraph Exhibitions).

PENNSYLVANIA, UNIVERSITY OF, at Philadelphia, non-sectarian, and co-educational in the graduate department; chartered in 1755; Provost, Charles C. Harrison, LL. D.; over 140,000 volumes in the library, besides a large number of unbound volumes and pamphlets. The officers of instruction number 258. The University comprehends the following departments, to each of which is given the number of students for the academic year 1898-99. The College, including the school of arts (365), the Towne Scientific School (284), and courses for teachers (277), 926; department of philosophy, 158; of law, 320; of medicine and hygiene, 854; of dentistry, 502; of veterinary medicine, 50; total, deducting names inserted more than once, 2,790. The degrees in course conferred at the commencement of 1898 were as follows: B. A., 18; B. S. (including economics, architecture, engineering, etc.), 62; M. E., 1; M. A., 3; M. S., 2; Ph. D., 24; LL. B., 97; M. D., 187; D. D. S., 101; D. V. M., 14; honorary degrees, L. H. D., Sc. D., D. D., LL. D., one each.

Houston Hall, a large and well equipped club house, was opened in January 1896; it is the home of the Houston Club, to membership in which any student or officer of instruction is eligible, the cost being two dollars a year. The property, securities, etc., of the University, on August 31, 1898, amounted to \$6,899,421; the obligations were \$369,533. Donations to the University for the year ending August 31, amounted to \$307,378, and those to the University Hospital were \$101,566. See ANTHROPOLOGY (paragraph University of Pennsylvania) and UNIVERSITIES AND COLLEGES.

PENSIONS. The report of the Commissioner of Pensions for the year ending June 30, 1898, showed that on that date the number of pensions on the roll was 993,714 as compared with 976,014 on June 30, 1897, a net gain of 17,700. The following table shows the different classes of pensions at each of these dates:

	1898.	1897.
Widows, Revolutionary soldiers.....	5	7
Daughters, Revolutionary soldiers.....	7	9
Survivors of war of 1812.....	3	7
Widows, war of 1812.....	2,407	2,810
Survivors, Indian wars 1832-1842.....	2,019	2,373
Widows, Indian wars 1832-1842.....	4,067	4,288
Survivors, Mexican war.....	10,012	10,922
Widows, Mexican war.....	8,132	8,072
Under general laws:		
Army invalids.....	327,080	336,299
Widows, army.....	92,545	94,602
Navy invalids.....	4,833	4,788
Widows, navy.....	2,300	2,375

Act of June 27, 1890:

Army invalids.....	399,366	378,609
Army widows.....	119,785	110,593
Navy invalids.....	14,543	13,831
Navy widows.....	5,944	5,766
Army nurses.....	655	663
Total.....	993,714	976,014

From this table it will appear that the largest number of pensioners came under the act of June 27, 1890. This act provided that "Any officer, soldier, sailor, or marine who served ninety days or more, in the military or naval service of the United States during the late war of the rebellion, who has been honorably discharged therefrom, and who is suffering from disability of a permanent character, not the result of his own vicious habits, which incapacitates him from the performance of manual labor in such a degree as to render him unable to earn a support, is entitled to pension under this act of not less than \$6 per month nor more than \$12 per month. In case of the death of any person named above, his widow becomes entitled to pension, provided she married him prior to June 27, 1890, and that she is without other means of support than her daily labor. If she remarries or dies, the child or children of such soldier or sailor under the age of 16 years becomes entitled." The annual value of the roll on June 30, 1898, was \$130,968,465, showing an increase of \$1,173,037 over the annual value of the roll on June 30, 1897, and the Commissioner reported his belief that the roll would continue to increase on account of claims from ex-Union soldiers who had served in the war of the Rebellion, since he estimates the number of such soldiers who had never received a pension at 200,000. By "annual value" is meant the amount of money required to pay one year's pension to the persons on the rolls at the rate or rates for which they are pensioned. When to this amount, the first payments, the cost of disbursements and fees of examining surgeons, the salaries and per diem expenses of the Bureau, and the balance due on account of medical examiners for the last quarter of 1897 are added, the gross expenditure during the year ending June 30, 1898, was \$148,765,971. As to appeals in pension cases, the report of the Assistant Secretary of the Interior states that the number disposed of during the year ending June 30, 1898, was 5,406, an increase over each of the preceding years, and that of this number 965 were dismissed. In deciding upon these cases of appeal, it has been the policy of the Department "to respond as far as the evidence and law would permit to the liberal spirit in which the pension laws have been enacted."

The Commissioner makes a serious objection to the operation of the act of June 7, 1888, whereby it was provided that all pensions to widows in consequence of death occurring from a cause which originated in the service since March 4, 1861, shall commence from the date of death of the husband. The Commissioner objects to this on the ground that a large number of widows who had not been pensioned or filed claims for pensions, received pensions for the entire period between the death of their first husbands and their remarriage, the second husband thus becoming the beneficiary of the government's generosity. By way of illustration the case was cited of a captain in a volunteer regiment who was honorably discharged. He died in 1871 without ever having filed a claim for pension. His widow remarried on March 30, 1887, having filed no pension claim, but in 1893 she filed her claim for a pension from the date of the death of her soldier husband to the date of her remarriage in 1887, a period of sixteen years, for which she received nearly \$4,000. Thus the second husband practically received the benefit of the pension which apparently was designed to aid the widow during her period of widowhood. Another practice of which the Commissioner complains arises from the clause of another act in regard to the claims of minors. Such claims have often been filed long after the claimant has passed the period of minority, and the Commissioner holds that it was not the intention of the law to have this money hoarded up and drawn out many years afterwards, but merely to aid and comfort the minor during the period of minority. The table showing the disbursements for pensions on account of army and navy during the year gives the gross expenditure including disbursements for pensions together with the cost of such disbursements, fees of examining surgeons and salaries and per diem expenses of the Bureau as \$148,542,607.85. The following table shows the disbursements for pensions, fees of examining surgeons, cost of disbursements, salaries, and other expenses of the Bureau and the number of pensions on rolls each fiscal year since July 1, 1865:

Statement showing disbursements for pensions, fees of examining surgeons, cost of disbursement, salaries, and other expenses of the Pension Bureau, and number of pensioners on rolls each fiscal year since July 1, 1865.

FISCAL YEAR.	Disbursements for pensions.		Fees of examining surgeons.		Cost of disbursement, maintaining pension agencies, etc.	Pension Bureau.		Number of pensioners on rolls.
	Army.	Navy.	Army.	Navy.		Salaries.	Other expenses.	
1866.....	\$15,158,598.64	\$291,951.24	Paid from Army and Navy pensions. No separate account kept.		*\$155,000.00	\$237,165.00	\$15,000.00	126,723
1867.....	20,552,948.47	231,841.22		\$66,057.42	*155,000.00	302,361.49	27,615.86	155,474
1868.....	22,811,183.75	290,825.61		231,658.26	*155,000.00	366,186.20	31,834.14	169,643
1869.....	28,168,323.84	344,923.93		85,543.50	*155,000.00	366,007.31	43,519.50	187,968
1870.....	29,043,237.00	308,251.78		73,161.00	216,212.86	332,660.00	51,125.00	198,686
1871.....	26,061,552.41	457,250.21		113,382.00	216,212.86	372,378.97	58,980.00	207,496
1872.....	29,276,921.02	475,825.79		222,986.87	431,720.03	436,315.71	57,557.78	232,189
1873.....	26,502,528.96	479,534.93		321,966.49	457,879.51	456,021.26	90,855.39	238,411
1874.....	29,603,159.24	603,619.75		247,966.32	447,663.17	444,052.24	75,048.72	236,241
1875.....	28,727,104.75	543,300.00		475,031.13	444,074.79	464,821.21	73,799.35	234,821
1876.....	27,411,809.53	524,900.00		487,614.76	447,702.13	468,577.80	98,798.88	232,187
1877.....	27,659,461.72	523,380.00		1,099,724.92	445,262.08	445,262.08	67,102.78	232,104
1878.....	26,251,725.91	534,283.53		853,561.86	443,096.56	443,096.56	41,240.90	223,908
1879.....	33,109,339.92	555,039.00		772,272.72	203,851.24	493,255.70	54,088.70	242,755
1880.....	55,901,670.42	787,558.66		876,108.51	221,926.76	532,517.84	55,085.68	250,803
1881.....	49,419,905.35	1,163,500.00		1,690,507.47	222,265.00	698,565.45	46,462.19	268,830
1882.....	53,328,192.05	984,980.00		1,614,392.80	234,544.37	868,113.92	130,981.85	265,697
1883.....	59,468,610.70	958,983.11		652,678.50	234,544.37	868,113.92	130,981.85	265,697
1884.....	56,945,115.25	937,272.22		782,631.08	285,620.29	1,723,285.68	241,555.83	303,658
1885.....	64,222,275.34	949,661.78		665,313.97	303,430.61	1,936,161.65	338,522.42	322,756
1886.....	63,034,642.90	1,056,500.00		678,395.44	275,976.55	2,122,926.54	511,492.12	345,125
1887.....	72,464,236.69	1,238,760.39		894,249.08	294,724.14	1,948,285.80	509,291.91	365,783
1888.....	77,712,789.27	1,237,712.40			248,280.42	1,968,599.66	430,195.91	406,007
1889.....	86,906,502.15	1,846,218.43		263,109.87	1,986,027.55	420,776.24	452,557	
1890.....	103,809,250.39	2,235,000.00		278,902.20	1,978,119.98	422,554.50	489,725	
1891.....	114,744,750.83	2,567,939.67		292,697.35	1,957,725.43	380,231.73	537,944	
1892.....	135,914,611.76	3,479,535.85		380,360.14	2,301,721.80	377,500.74	676,160	
1893.....	153,045,460.94	3,861,177.00		500,122.02	2,494,122.87	178,823.44	876,088	
1894.....	186,495,965.61	3,490,760.56		519,292.95	2,460,044.50	230,768.67	966,013	
1895.....	136,156,803.35	3,650,980.43		517,430.37	2,403,522.75	370,844.69	969,544	
1896.....	134,632,175.88	3,582,909.10		563,449.86	2,461,890.50	504,912.52	970,524	
1897.....	136,313,914.64	3,635,802.71		565,027.85	2,258,959.35	494,800.94	970,673	
1898.....	140,924,343.71	3,727,531.09		572,439.41	2,262,597.70	474,350.52	976,014	
Total.....	\$2,303,888,611.90	\$47,667,309.89	\$14,466,516.86	\$309,273.11	\$11,569,632.14	\$42,230,531.90	\$7,229,310.04	963,714
							

* Approximate.

† Now included in Army.

The Commissioner reports that a separate division is being organized for the adjudication of claims growing out of the war with Spain. The veterans of this war will receive their pensions under the general laws respecting permanent disabilities contracted while in service, and not under the act of June 27, 1890, which applies only to the war of the rebellion.

PENSIONS, OLD AGE. See GREAT BRITAIN and NEW ZEALAND.

PEOPLE'S CHORAL UNION, organized in 1894, has 1,300 members. President, John McGoodale; Secretary, John McDonough. Office 41 University Place. See PEOPLE'S SINGING CLASSES.

PEOPLE'S SINGING CLASSES, belonging to the People's Choral Union (q. v.), Frank Damrosch, Director, comprised eight elementary and three advanced classes, which meet at Cooper Union and Harlem Arcade.

PEPPER, WILLIAM, one of the most distinguished physicians in America and formerly provost of the University of Pennsylvania, died at Castle Verona, Pleasanton, Alameda county, California, July 28, 1898. He was born in Philadelphia, Pa., August 21, 1843; received his bachelor's degree from the University of Pennsylvania in 1862 and two years later was graduated from the medical department. From 1868 to 1870 he lectured on morbid anatomy in the University and on clinical medicine during the six years succeeding. He was professor of clinical medicine from 1870 to 1887, when he was called to the chair of the theory and practice of medicine, which position he held up to the time of his death. In 1881, Dr. Pepper became provost of the University, and during his administration the institution experienced an unprecedented development. During this time the work he accomplished was immense; he not only gave attention to municipal education and government, to his unusually large professional practice, to his literary work, to his lectures in the medical school, but he directed a successful policy for the entire university. He founded the *Medical Times*, which he edited in 1870-71; was medical director of the Centennial Exposition in 1876; and assisted in founding the Pennsylvania Museum and School of Industrial Art. Dr. Pepper received from the King of Sweden the decoration of Knight Commander of the Order of St. Olaf; he was president for several years of the Academy of Natural Science, was a member of the American Philosophical Society, president of the American Climatological Society in 1886 and of the Association of American Physicians in 1891. At the first meeting of the Pan-American Medical Congress, which was held in Washington in 1893, he was chosen president. On account of overwork Dr. Pepper resigned his position as provost of the University in 1894. At that time it became known that during his administration, he had not only suffered financial loss through the extra time given to the University, but had declined any salary as provost; furthermore, he had contributed yearly \$20,000 to \$30,000 to the University, and at the time of his resignation gave \$50,000 for the University hospital. In 1881 the degree of LL. D. was conferred upon him by Lafayette, and in 1888 by Princeton. Among his writings his most important work is *The System of Medicine by American Authors* (1885-86). Dr. Pepper was not only prominent for his technical scientific acquirements and his professional work, but for his efforts towards various social reforms and his interest "in everything that related to the welfare of the city, State, and nation."

PERNICIOUS FEVER. See PUBLIC HEALTH.

PEROSI, The ABATE, composer, born in Tortona, December 20, 1872, the son of a choir master of the Tortona Cathedral. At fourteen he composed madrigals, at eighteen he became organist at Monte Cassino, studied at the Milan Conservatory, and in 1893 was called to Ratisbon. At twenty-three he took holy orders and became choir master at St. Mark's, where he was greatly beloved. In 1898 he was transferred to the Sixtine Chapel. His oratorio, *The Resurrection of Lazarus*, was performed at the Pagliano, October 22-23, 1898, and took all Italy by storm. The Abate Perosi is a devoted admirer of Bach, Wagner, Palestrina and Orlando di Lasso, whose influence is felt in his works. His other oratorios are *The Transfiguration of Christ* and *The Resurrection of Christ*. He has also written 15 masses, a fine miserere, motets, hymns, etc., and is finishing an oratorio *The Massacre of the Innocents*. See MUSIC.

PERRY, WILLIAM STEVENS, D. D., LL. D., Protestant Episcopal bishop of the diocese of Iowa, died in Dubuque, Iowa, May 13, 1898. He was born in Providence, Rhode Island, January 22, 1832; was graduated at Harvard, 1854; was ordained deacon at Newton, Massachusetts, in 1857, and priest at Boston the following year. He held several rectorships in New England, and while rector of Trinity Church, Geneva, New York, he occupied the chair of history in Hobart College, 1871-73, and in 1876 served for a few months as president of the institution. He was consecrated bishop of Iowa in 1876, remaining in the office till his death. In 1887 he was elected bishop of Nova Scotia, but did not accept the office. Bishop Perry was associated with Dr. John Cotton Smith in editing *The Church Monthly*, in 1864. He published

many works, those upon church history adding most to his reputation. Among his works are: *Documentary History of the Protestant Episcopal Church* (1864); *Historical Collections of the American Colonial Church*, including Massachusetts, Pennsylvania, Delaware, Maryland, and Virginia; *The Connection of the Church of England with Early American Colonization*; *Questions on the Life and Labors of the Great Apostle*; *History of the American Episcopal Church* (two volumes, 1885); *Life Lessons from the Book of Proverbs*; *Some Summer Days Abroad*.

PERSIA, called by the natives Iran, is one of the strongest and most extensive native kingdoms in western Asia. It lies between the Turkish possessions and Afghanistan and has an area of about 628,000 sq. m., with a population estimated in 1897 at 9,000,000. The capital is Teheran, with a population of 210,000. Among the chief products are wheat, barley and other cereals, fruit, gum, wood, silk, opium, carpets and tobacco. In some parts of the country the vine flourishes, and the raising of live-stock is also an important industry. The manufactures of Persia are not commensurate with its wealth and importance. The people are not enterprising and the industrial improvements of civilized countries are introduced slowly. Thus a United States Consular Report, published in January 1898, refers to the fact, that although the first telegraph line in Persia was built about 36 years ago, the yearly receipts of the telegraph even now amount to only about \$60,000, and no new lines have been erected for some years. There is an Indo-European line of telegraph passing through the country, which is the property of the Indian government and a London company. Bushire and Karashi are connected by both a land and a cable line. The government owns the local lines. The progress in respect to telephones has been equally slow, the Consular Report referred to estimating the number of miles of wire at not more than 50. The principal trade routes connecting Persia with outside nations are for the most part under Russian control on the north and under British control in the south. Those passing through Russian territory are the routes via Tiflis, Tabriz, and Kazvin; via Afghanistan; via the southern Caspian ports; via the Trans-Caspian railway and the Khanates. The route under British control goes through Afghanistan and Beluchistan and the British trader dominates the commerce that enters the ports of the Persian Gulf. The other principal routes are through Turkish territory. The government is absolute, the Shah being an autocrat who administers the affairs of the realm through a responsible ministry. In 1898 the reigning sovereign was Muzaffar-ed-din, who succeeded to the throne in 1896. It was he who introduced the plan of governing by means of a responsible cabinet, but it is said that the system has not worked well and that the changes in the ministry have been frequent. It was reported in 1898 that under the influence of American missionaries the government had taken measures for the improvement of the condition of the Christians in the Province of Tabriz and had recognized the Protestant organization of Urumia. See ARCHÆOLOGY.

PETROGRAPHY. See GEOLOGY.

PETROLEUM. For the first time in years the production of the United States was surpassed by that of Russia. The figures of American production for the last two years are:

1897.....	56,985,643 bbls.
1898.....	53,800,000 bbls.

The producing States were California, Kansas, Kentucky, Tennessee, Texas, Wyoming, Ohio, Pennsylvania, and West Virginia. There was a small increase in the Lima, Ohio, field but a large decrease in the Eastern Apalachian district. Russia in 1897 produced 6,919,000 metric tons and the United States 7,708,236 metric tons. For the first six months of 1898 the Russian output amounted to 3,993,300 metric tons, with no evidence of falling off, which would make the year's production close to 8,000,000 metric tons, while that of the United States for 1898 showed no increase. Much prospecting was done in the western States during 1898, and one result is the reported occurrence of oil from the vicinity of Yakutat bay, Alaska. The California oil fields were extended and at Summerland wells were sunk in the sea 200 feet from the shore. A promising oil field is being developed at Corsicana, Texas, and oil has been discovered near Dallas.

U. S. production from 1888 to 1896, inclusive:

Year.	Quantity. barrels.	Value.
1888	27,612,025	\$17,947,620
1889	35,163,513	26,963,640
1890	45,822,672	35,365,105
1891	54,291,980	30,526,553
1892	50,509,136	26,034,195

Year.	Quantity. barrels.	Value.
1893	48,412,666	28,932,326
1894	49,344,516	35,522,095
1895	52,983,526	57,632,296
1896	60,960,361	58,518,709

Exports.—The exports in 1897 were :

Product.	Gallons.	Value.
Crude petroleum.....	121,864	\$5,044
Naphthas	13,704	1,029
Illuminating oil.....	604,446	46,876
Lubricating oil and paraffine.....	52,679	6,732
Residuum	12,247	335
Total.....	1,004,941	\$60,007

The export trade in American petroleum was good during 1898, and the prices were about 10 per cent. higher than those paid for any others in competitive markets. This is due to the fact that the American oil makes a better illuminant, and gives a larger proportion of refined oil per barrel.

PERU, a republic lying between Ecuador on the north and Chile on the south on the Pacific coast of South America, consists of nineteen departments whose area aggregates 463,747 square miles. The population, according to the last census (1876), exclusive of about 350,000 uncivilized Indians, was 2,621,844, and at present is estimated at 3,000,000. The largest department is Cuzco (95,547 square miles) and the smallest is Ica (6,295); the most populous is Ancachs (284,091) and the least populous, Moquegua (28,786). It has been estimated that 57 per cent. of the population are aborigines; 23 per cent. mixed races; and 20 per cent. includes the descendants of Spaniards together with 18,000 Europeans and nearly 25,000 Chinese. The capital, Lima, numbered in 1876, 100,156 inhabitants, and in 1891, 103,956; the other cities of importance are: Arequipa (35,000), Cuzco (22,000), and Callao (15,000).

Government.—The constitution of Peru, like those of the other South American republics, is modelled to a considerable extent on that of the United States. The executive authority is vested in a president, who is elected for four years and who exercises his functions through a Cabinet of six ministers,—those of the Interior, Foreign Affairs, War, Finance, Justice, and Public Works. Action of the President does not become authoritative until endorsed by some minister. There are two vice-presidents also elected for four years. The President in 1898 was Don Nicholas de Piérola. The legislative body consists of a senate, the members of which are chosen by the provinces, the ratio being one in every 30,000 inhabitants or fraction exceeding 15,000; and of a house of representatives nominated by the electoral colleges of the provinces, the rate being two members for a department having two provinces and one more for each additional two provinces,—a province, it should be understood, being a division of a department.

Finance.—Estimated revenues and expenditures in soles for fiscal years ending May 31:

	1893.	1894.	1895.
Revenue	7,066,330	7,519,147	8,598,176
Expenditure	6,572,927	7,345,847	8,004,318
		1896.	1897.
Revenue		10,721,522	10,721,523
Expenditure		11,308,243	11,308,243

The revenue is derived chiefly from customs; other sources are taxes, salt monopoly, and posts and telegraphs. The more important items of expenditure are in the departments of Government, Justice, Army and Navy, and Hacienda. The foreign debt consisted of two loans, contracted in England, the first in 1870 for £11,141,580 at 6 per cent., and the second in 1872 for £20,437,500 at 5 per cent., the total being £31,579,080. The interest lapsed from 1876 to 1889, the arrears being at that time £22,998,651. In January 1890, Peru was released from these obligations, and in return ceded to the bond-holders for a period of sixty-six years the federal railways, mines, lands, and guano deposits. In 1889, for the purpose of consolidating the internal debt, bonds amounting to 36,174,150 soles were issued; by 1897 the total amount redeemed was 9,416,000 soles. Redemption then ceased, but interest payments are continued. The salt industry since 1896 has been a government monopoly; the pro-

ceeds are devoted to the ransom of Tacna and Arica, the Peruvian provinces occupied by Chile.

Army and Navy.—The peace footing consists of six battalions of infantry numbering about 2,100, of two regiments of cavalry numbering about 625, and of two brigades of artillery numbering about 450, making a total of about 3,175. The police force numbers between 2,000 and 3,000 men. The navy consists of one cruiser (1,700 tons), one training ship, and three steamers.

Industries.—The chief industries of Peru are agriculture and mining; manufactures, though on the increase, are unimportant. The country is rich in minerals, while over large areas the soil is fertile, products both of the temperate and of the torrid zone being raised in abundance. The chief products are sugar, coffee, and cotton; others of importance are tobacco, cacao, rice, cereals, wines and spirits, the potato, dyewoods, medicinal plants, and many kinds of fruits. The chief coffee-producing districts comprise the concession made to the Peruvian Corporation—about 3,750,000 acres in Chanchamayo (central Peru) and about 1,250,000 acres in the valley of the Perené. About 1,060 tons of coffee are annually exported. Sugar is produced on about 187,000 acres, 95,000 being planted in cane; the production for 1896-97 amounted to 65,000 tons. The cotton export in 1895 was 5,500 tons, and the annual export of cocoa leaves amount to about 380,000 kilogrammes. The annual export of alpaca wool is about 4,000,000 pounds valued at about \$2,000,000, and that of dye-stuffs, drugs, and chemicals is valued at \$7,500,000. See COTTON AND THE COTTON INDUSTRY.

From before the time of the conquest the gold and silver mines have been worked, but there are still many sections, known to be rich in precious metals, that have not been opened up. Gold is found in six of the nineteen departments, but in general mining operations are not highly successful, they frequently lack adequate capital, and are always impeded by the wretched condition of the roads. Many gold fields have either been abandoned or are worked only by natives. The estimated total output of silver in 1896 was 3,300,000 ounces. In 1897 the number of mining claims of all kinds and including many which are unworked numbered 3,475; among these are fields of gold, silver, mercury, copper, zinc, lead, sulphur, salt, coal, and petroleum. Vast petroleum beds exist in the province of Paíta, but notwithstanding a large expenditure of capital, the return both in quality and amount of oil, has not yet been very encouraging. About one-half of the mining companies are controlled by Peruvians; there were in 1896 fifty-six establishments engaged in the working of mines and metals and in the refining of petroleum, having a total capital of 18,781,000 soles. A few years ago anthracite coal of excellent quality was discovered in and near the province of Hualgayoc along the slopes and high ridges of the Andes both on the east and the west sides. Concessions have been made for the mining of the coal and the construction of a railway, 121 miles in length, to the fields. The Pacific Company, which has invested in this enterprise, has a capital of \$20,000,000. So rich are the deposits that it is thought 2,000,000 tons can yearly be mined and delivered at the port at a cost of \$2 (gold) a ton. Large veins of anthracite have been found in the department of Cajamarca and in the department of Libertad one hundred miles south. It will not be easy to obtain this coal as the beds are at a height of from 7,000 to 13,000 feet and some of them on the Amazon side of the divide. In 1898 a railroad 41 miles long was in operation between Pascasmayo and Yonan, where a mine is worked under Peruvian control. Analyses of the coal from the new districts have been made, the coal from Cajamarca being similar to the average Pennsylvania anthracite, and that from Libertad equaling the best Pennsylvania coal; the Libertad coal showed a percentage of 90.906 fixed carbon and 3.816 ash. It has been thought that the exploitation of these fields will revolutionize the coal trade on the Pacific coast of both South and North America; it must be said, however, that the new Mexican mines in the Yaqui valley and mines in other parts of Mexico will probably prove strong competitors to these fields in the Andes. Up to the present time the greater part of the 3,000,000 tons of coal used annually in western South America has come from Australia, England, Japan, and British Columbia. Besides anthracite, the Andes fields contain lignite, but no bituminous coal.

Commerce.—Foreign commerce is carried on principally through the ports Callao, Paíta, Eten, Chimbote, Salaverry, Mollendo, and Pisco; of the exports about one-half go to Great Britain and about one-fourth to Chile; of the imports about one-third are from Great Britain and one-sixth from Germany. The following are statistics in soles for exports and imports:

	1893.	1894.	1896.	1897.
Exports	19,084,636	14,758,635	21,862,348	31,025,376
Imports	11,735,269	11,743,636	17,505,148	

The increase in exports of 1897 over 1896 is seen to be 9,163,028 soles. The chief exports are sugar, silver, cotton, wool, rubber, coffee, cocaine, cocoa leaves.

Shipping and Communications.—There entered in 1896 at the port of Callao, of vessels over 50 tons, 525 vessels (592,783 tons), and 960 coasting vessels (11,474 tons); and cleared 523 vessels (590,886 tons). More than half of this tonnage was British. In the same year the merchant marine consisted of 36 vessels over 50 tons, with a total tonnage of 9,953; and 96 vessels were under 50 tons, aggregating 1,246 tons. Internal communication in Peru is difficult, there are scarcely any wagon roads, but bridle paths instead. The total railroad mileage in 1895 was 924 miles, of which the 800 miles belonging to the State was made up of ten lines. The remaining 124 miles constitute six lines owned and operated by private companies. The ten lines belonging to the government, along with certain State lands, mines, and guano deposits, were mortgaged in 1890, as before stated, for sixty-six years to the Peruvian corporation, which is chiefly controlled by English capital. Many remarkable feats of engineering have been accomplished in the construction of the Peruvian railways, and it is said that the country has expended on them, including those ceded to Chile, over \$175,000,000 (gold). In 1896 there were 1,491 miles of telegraph lines managed by the government, and 88,326 messages were dispatched. Marine telegraph-cables touch at Callao, Paita, Lima, and Mollendo. There is a telephone system with 2,300 miles of wire. There are 306 post-offices, their revenue and expenditure in 1896 balancing at 294,084 soles.

Religion and Education.—Political freedom is guaranteed by the constitution, but the State religion is Roman Catholic and the public exercise of other faiths is prohibited. The law, however, is not strictly enforced, there being Anglican churches in Lima and Callao. Elementary education is compulsory, and in schools under control of the municipalities, it is gratuitous; in some provinces and in government high schools a small tuition fee is charged. The University of San Marcos, the oldest in America, being chartered by Charles V, is situated in Lima, and has departments of theology, law, medicine, economics, and applied science. There is also in Lima a school of mines and engineering, various private schools, and a public library. Two less important universities are situated at Cuzco and Arequipa.

Money.—Paper money was withdrawn from circulation in 1888. The sol is worth \$0.436 United States gold.

History.—Senor Pierola, President of Peru, submitted a message to the Congress in October 1897, which aroused so much indignation among the members that practically a vote of censure was passed, whereupon the Ministry resigned. The message dealt with the recent laws passed by Congress in relation to public finance. On the ground that these laws ordered an expenditure which would result in a deficit, and on the ground that he considered some of the laws unconstitutional, President Pierola refused to comply with them. The new cabinet was formed on November 25, under Senor Alejandro Lopez de Romana as Premier and Minister of the Interior. One of the most noteworthy bills passed by the Congress in this session was the one authorizing the marriages of non-Catholics and legalizing civil marriages. At this time territorial questions were becoming of considerable importance among the republics of southern and western South America. There was a rumor that Peru, Chile, and Argentina contemplated an alliance for the purpose of conquering Bolivia, and dividing the territory. This purpose, however, seems to have been abandoned in the more urgent territorial questions which came forward between Peru and Chile, and the latter country and Argentina. According to the treaty of Ancon, which was signed October 20, 1883, the Peruvian border provinces Tacna and Arica were ceded for a period of ten years to Chile; at the end of this time the inhabitants of the provinces were to decide to which country they would permanently adhere, the government gaining the territory promising to pay \$10,000,000 to the other. The two governments were unable to decide in what way Tacna and Arica should render their decision, and the matter had reached no settlement when the ten years had expired. In the latter part of 1897 various rich Peruvians were endeavoring to collect the \$10,000,000 with which to remunerate Chile in the event that the provinces should return, as they trusted they would, to the mother country. In the early part of 1898 the matter threatened to develop serious international complications, but in the latter part of April a treaty was signed arranging for the permanent transfer of the provinces as the inhabitants might desire, and referring all disputes to the arbitration of the Queen Regent of Spain. See CHILE.

PHI BETA KAPPA, composed of 50 different College Chapters, held its triennial meeting at Saratoga Springs, Sept. 7, 1898. The following officers were elected: J. A. De Remer, Schenectady, President; Rev. E. B. Parsons, D. D., Williamstown, Mass., Secretary and Treasurer.

PHILHARMONIC SOCIETY, London, founded in 1813, for the encouragement of instrumental music. It is the oldest orchestral society in London. The Queen and several members of the Royal family are its patrons. Conductor, Sir Alexander Mackenzie; Honorable Secretary, Francisco Berger. It gives seven concerts during each season. Last year, its 86th season, Moritz Moszkowski appeared as a pianist.

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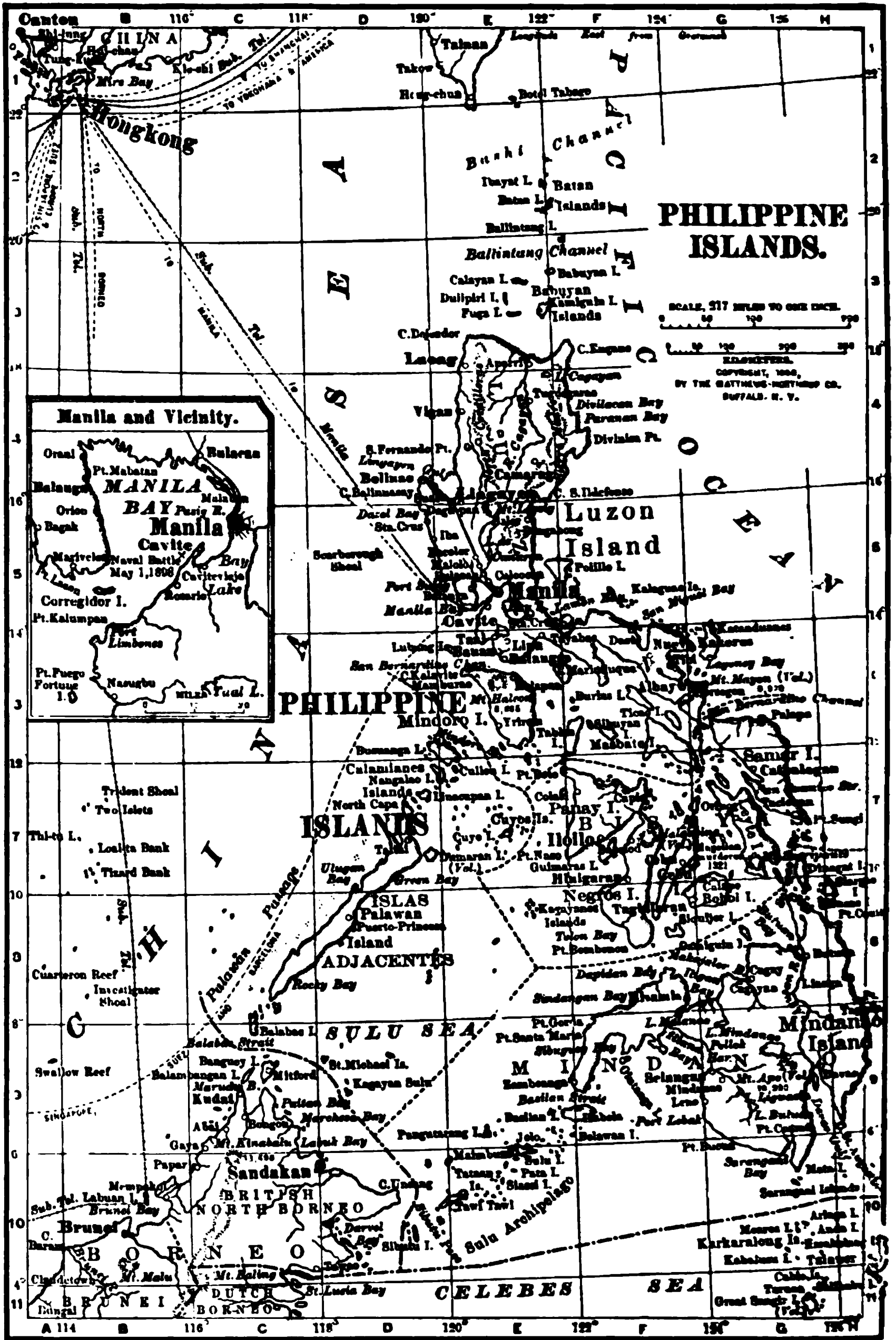
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Saint Saëns as an organist, and Eugene d'Albert conducted his "Symphony in F" and played Bethoven's piano concerto in E-flat. Many of the most famous orchestral compositions were written for this society, for example, Beethoven's Eroica, Fifth and Ninth, his overtures to Egmont-Fidelio, Coriolan, and Lenore, his violin concerto; Mendelssohn's Italian Symphony, Spohr's *Weihe der Töne* and Historical Symphonies; Schumann's B-flat, etc., etc. Cherubini, Weber, Spohr, Mendelssohn, Hiller, Wagner, Gounod, and other great musicians have appeared as conductors of this society. Hon. Secretary, Francisco Berger, 6 York street, Portman square.

PHILHARMONIC SOCIETY OF NEW YORK, founded in 1842, incorporated in 1853. Its first concert took place at the Apollo rooms, Dec. 7, 1842. The Chinese rooms, Niblo's Garden, Irving Hall, the Academy of Music, the Metropolitan Opera House, and Carnegie Hall have been used for these concerts. The Conductors have been H. C. Timm, E. J. Loder, U. C. Hill, Theodore Eisfeld, Carl Bergmann, Leopold Damrosch, Theodore Thomas, A. Neuendorf, Theodore Thomas again, Anton Seidl, and Emil Paur. President, E. Francis Hyde; Secretary, Aug. Roebbelen; 98 members.

PHILIPPINES, the group of islands acquired by the United States from Spain in 1898, lie in the Pacific Ocean between 4° 45' and 21° north latitude.

Area and Climate.—They are thus wholly within the tropics and the climate is generally hot, but varies considerably in the different parts of the group. According to the records kept at the Jesuit Observatory in Manila, the thermometer very rarely rises above 60°, and the average temperature is 80°. It is further stated that there is no month in the year in which the temperature does not rise as high as 90°. The lowest mean monthly temperature occurs in December and January, and the highest in April and May. Malaria is said to prevail in some of the islands, and in general the climate is injurious in its effect upon white women and children. The principal islands with their area in square miles are as follows:

Luzon	41,000
Mindanao	37,500
Samar	5,300
Panay	4,600
Palawan	4,150
Mindoro	4,050
Leyte	3,090
Negros	2,300
Cebu	1,650
Masbate	1,315
Bohol ...	925
Catanduanes	450

Besides these there are twenty-one islands with areas ranging from 100 to 250 sq. m. The total area of the group is estimated approximately at 114,000 sq. m., of which the islands of Luzon and Mindanao include more than half.

Population.—The population is roughly estimated at 8,000,000, but this is conjectural, for the last census taken by the Spanish government was in 1887. This gave the aggregate population as 6,000,000 in round numbers. The report of Major-General F. V. Greene, U. S. V., stated that the population was somewhere between 7,000,000 and 9,000,000. The greater part of the population inhabits the islands of Luzon, Panay, Cebu, Leyte, Bohol and Negros, and the average density for these six islands is 91 per sq. m., which is fifty per cent. greater than the density of population in Illinois and Indiana, and nearly half as great as in France. All the natives are of the Malay type. According to a recent report 6,000,000 were Christians, and of these five-sixths were either Tagalos (Tagals) or Visayas. The Tagalos are semi-civilized and though considered by the Spaniards ignorant, cruel and treacherous, seemed to Americans to be peaceable and law-abiding, although brigandage is said to be not uncommon. The natives of the island of Luzon, as described by visitors at Manila, appear to be of small stature, with a coppery brown skin resembling that of a mulatto, though somewhat darker. Reports differ as to their character and capacity for civilization. Some writers charge them with deceitfulness, pointing to instances of treachery on the part of servants after a long period of faithful service. They are also said to lack originality, and to be irresponsible in financial matters. Indolence is another charge that is frequently brought against them, but in regard to this it should be remembered that their necessities are slight, and that no one can do the same amount of work in the Philippines as in a temperate climate. In their favor it has been urged that they are open-handed and hospitable in their relations with travelers; that they are cleanly in their habits and that their home life is well regulated and happy. In religion they are devout Roman Catholics. The Visayas and Ilocanas, who, with the Tagalos make up the great majority of the natives, do not exhibit im-

portant differences in racial character. Besides these there are more than thirty different races. The Chinese, whose number is estimated at 75,000, are found principally in Manila. One of the most interesting of the non-Christian tribes is the Moros in regard to whom the following account, quoted from Mr. Dean C. Worcester's work on *The Philippine Islands*, published in 1898, may be of interest:

"The men are of medium height, and their physical development is often superb. They dress in pantaloons, waistcoat, jacket, sash and turban. Their garments are gaudily colored, and are often showily embroidered or otherwise ornamented. Their pantaloons are usually skin-tight below the knee, and loose above. If fighting is expected, however, they wear loose black trousers. The rank of a Moro is indicated by the way he ties his turban. All males above sixteen years of age go armed, unless prevented from doing so by the Spanish. The Moros make their own steel weapons, which are often beautifully finished, and are always admirably adapted to the purposes for which they are intended. In close combat they usually trust to a *barong*—a weapon somewhat on the plan of a butcher's cleaver, with thick back and thin razor edge. It is capable of inflicting fearful injury. To lop off a head, arm or leg with a *barong* is merely child's play. The strong and skilful warrior prides himself on being able to halve an opponent, if he can catch him fairly across the small of the back. Executioners use heavy, two-handed knives for beheading their victims. The straight *kris* is a narrow-bladed, double-edged sword, used for cutting and thrusting. The serpent *kris*, with its wavy double-edged blade, is used for thrusting and inflicts a horrible wound. The *campilan* is straight-edged, two-handled sword, with a blade wide at the tip, and steadily narrowing toward the hilt. It is used for cutting only, and is tremendously effective. Under all circumstances, a Moro carries *barong*, *kris*, or *campilan* thrust into his sash. If he expects serious trouble, he has in addition a shield of light wood, and a lance with a broad, keen head. His conveniences for working steel are of the simplest, but the blades which he produces are highly tempered and often beautifully finished. He sometimes works silver in with the steel or even inlays it with gold. The hilts of his side-arms are of hard polished wood or ivory, and are sometimes handsomely carved. He is crazy to get hold of firearms, but seldom succeeds. In any event he is usually a very bad marksman."

"Moro women are inordinately fond of bright colors, scarlet and green being their favorites. Their garments are a skin-tight waist, which shows every line of the bust and arms, a baggy divided skirt, and a *jabul* made by sewing together the two ends of a long piece of cloth. The *jabul* is draped about the body in various ways, and may be thrown over the head to keep off the sun."

"Moro children usually possess clothes, like those of their elders, but up to the age of puberty they seldom make use of them, as most of their time is spent in the water. They swim and dive like little ducks. In passing through a village in a canoe I have often seen a crowd of children standing on the edge of a house-platform, while one of their number repeated some formula, until, at a given word, they all jumped into the water, and tried to see which could remain under the longest. They never deigned to swim around my boat, with its wide outriggers, but simply dived and went under it."

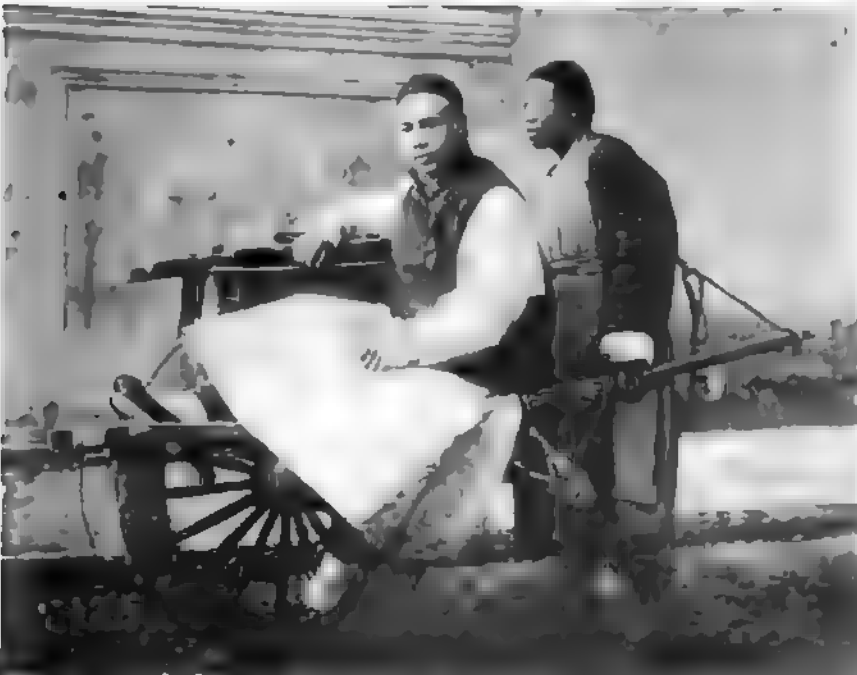
"The men are very skilful boatmen and sailors. Their *praus*, which are carved out of logs with great skill, are frail-looking affairs, but bamboo outriggers prevent their sinking even when filled with water. In bow and keel they are sharp as a knife, and they pass through the water with very little resistance. Most of them carry small sails, but their crews are always provided with long, slender paddles. In fact, the paddles are so long that they have to be put into the water with a peculiar sidewise sweep. The Moro stroke is very odd. As the paddle is brought into the water, edgewise, it is struck near the blade against the side of the boat; it is then carried quickly back, and at the end of the stroke the blade is brought out by depressing the handle until it hits on the other side of the boat. The two clicking sounds thus produced enable the men to keep perfect time. Of course the handles of paddles on opposite sides cross each other as the stroke is completed, and a war canoe rushing on, with kettledrums beating, men swinging and paddles crossing in perfect time, is a sight that one is not likely soon to forget."

"As a rule the men consider it beneath their dignity to engage in manual labor. What are slaves for? They do condescend to dive for pearls, however, and their performances are almost incredible. I have held the watch on them while they remained under water from two to three minutes. We once sent the *mandarin* of the village into 'black water' for a certain kind of coral which we believed could be found there. He came up with blood running from nose and ears, *but he brought the coral.*"

Surface.—The islands are largely of volcanic formation, and some volcanoes are still active. Of these Apo, in Mindanao, is the largest, having an estimated height of 10,312 feet, while the most striking and picturesque is Mayon, in the island of Luzon, having a height of more than 8,900 feet. There are other active volcanoes in Negros, Mindanao Camiaguin and some of the smaller islands. There are also non-volcanic



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SCENES IN THE PHILIPPINES — 1. Hauling lumber. 2. Native cab.

mountains of considerable height in all the larger islands. Chief among these are Mount Halcon in Mindoro, and San Cristobal in Luzon. Rich vegetation clothes most of the non-volcanic mountains. Fresh water lakes and rivers occur in Luzon and Mindanao. Vast tracts of virgin forests are still to be found, but the cutting down of the trees is steadily going on. In some of the islands the soil is remarkably fertile, the crops being raised for years in succession from the same piece of land without artificial enrichment of the soil.

Agricultural and Forest Products.—The chief occupation is agriculture, but it is estimated that only one-ninth of the surface is under cultivation. The soil is very fertile. The chief products are rice, corn, hemp, sugar, tobacco, cocoanuts, coffee and cocoa, and all fruits to be found in tropical climates grow in abundance. Sugar, hemp, tobacco, and to a less degree, coffee, are produced for export. Rice and corn are raised chiefly in Luzon and Mindoro. Rice was formerly exported, but according to the latest reports, is insufficient for home consumption, and a considerable amount is imported. The best quality of tobacco is found in Luzon, and a large part of it is consumed on the islands. The most famous product of the island is perhaps Manila hemp, which grows in the greatest abundance in the volcanic districts which have a heavy rainfall. The larger part of the export of this product goes to England and the United States. The cocoanut palm is found throughout the entire archipelago, and a considerable quantity of cocoanuts is each year exported. There is a species of tree cotton which grows wild on many of the islands. The cacao tree flourishes in the Philippines and the crop is large, but somewhat uncertain, owing to the violent winds. Among the other native products may be mentioned the areca nut, the bamboo, castor oil, rattan, gutta-percha, etc. The forests abound in valuable timber, including hard woods, capable of receiving a beautiful polish. On some of the islands cattle are raised extensively for beef, but in general the farm animals are not numerous.

Mineral Wealth.—The mineral resources of the Philippines have not been developed, but are said to be considerable. Deposits of coal, petroleum, iron, lead, sulphur, copper and gold are found. The coal should properly be classed as a highly carbonized lignite resembling the coal of Japan. Very extensive beds of lignite are found in the islands of Luzon, Cebu and Mindoro. The finest bed is reported to be in the small island of Batan, lying east of the southern part of Luzon. It is said that gold probably occurs in every part of the archipelago. It has been known to exist for many years, and recently a gold mining syndicate was formed in London for the purpose of developing the mines of the Philippines. This movement, however, was checked by the rebellion of 1896. Gold is reported to exist in many parts of the island of Luzon as well as in the islands of Mindoro, Cebu, Bohol, Mindanao, Panaon, Panay, Catanduanes, Sibuyan and Samar. The island of Cebu is reported to contain petroleum and natural gas. Copper and iron occur in many of the islands, and there are signs that lead, sulphur and quick-silver also exist in paying quantities. Among the non-metallic minerals may be mentioned silver, marble and kaolin.

Industries.—The only manufactured product exported in any considerable quantity is cigars, and outside of the tobacco factories few manufacturers are to be found in the Philippines. Wood-carving and furniture-making are carried on, however, as well as the weaving and dyeing of cloth. A fine fabric known as *pina* is made from pineapple leaves, and is embroidered by the native women. The water power of some of the northern islands is said to be abundant. Labor is exceedingly cheap, wages being estimated at from four to eight dollars a month. But it is hard to keep the native at regular work, and labor is often scarce.

Commerce and Communications.—At the close of the year 1898 the figures for the total exports and imports from and into the Philippines could be obtained for no later than 1896. During that year the imports amounted to \$10,631,250, and the exports to \$20,175,000. The United States contributed 1.53 per cent. of the imports and received 24.57 per cent. of the exports. In 1895 the exports from Spain to the Philippines amounted to \$4,819,344, and the exports from the Philippines to Spain to \$4,973,589. In 1896 the imports from Great Britain were \$2,467,090, and the exports to Great Britain, \$7,467,500. During the year ending June 30, 1898, the exports to the United States amounted to \$3,830,415, and the imports from the United States to \$127,804. The chief articles of export from the Philippines are sugar, Manila hemp, copra and tobacco. And the chief imports are cotton, woolen and silk manufactures, machinery, metals and metal manufactures, and provisions. There is a large internal commerce between Manila and the different islands. There is only one line of railway, which covers a distance of about 120 miles. A regular line of mail steamers maintains communication between the islands. Telegraph lines connect Manila with most of the provinces of Luzon, and there is cable communications with the Visayas and the southern islands, and with Hong-kong. A subsidized line of steamships runs from Manila to Barcelona in Spain, and there is regular steamship communication between Manila and Hong-kong.

Finances.—For the fiscal year ending June 30, 1897, the revenues were \$17,474,020,

and the expenditures, \$17,258,145. Taxation is the principal source of revenue and the most important tax is the *cedula*, or poll tax which averages about \$3 for each adult. There is a specific tax on imports amounting to about 13 per cent. ad valorem. It was estimated that the revenue from imports had increased from \$566,143 in 1865, to \$3,695,446 in 1894. There is a very small free list. The importation and sale of opium is a monopoly which is sold at auction to the highest bidder for a term of three years. The standard of value has been the Mexican milled dollar, but within recent years the Spanish dollar has also been introduced.

Manila and its Surroundings.—In connection with the events of 1898 the following details in regard to Manila and the adjoining district may be of interest. The bay of Manila penetrates the western side of the island of Luzon for a distance of about thirty miles. In the interior lies the large Laguna de Bahia, from which the Pasig river flows into the bay. Directly across the bay, at a distance of about seven miles from Manila, is the town of Cavité, which is provided with a naval arsenal and land defenses. By road, however, the distance from Cavité to Manila is 15 miles. On the south bank of the Pasig river, at its mouth, is the old walled city of Manila, comprising a fortified enclosure between the north bank of the river and the bay. Massive walls surround it and at the northwest angle of these walls is the royal fort of Santiago. The old city which lies within this fortified enclosure, has a population of about 15,000. It contains the cathedral, the Royal Court of Chancery, the churches and convents of San Augustin, the Royal and Pontifical University of Saint Thomas, the Municipal Athenæum, the buildings of the Recoletos of San Francisco, the hospital of San Juan de Dios, and the military hospital. This is the Manila of history, having been founded in 1571. The modern city of Manila with its population of about 300,000 lies on the north shore of the Pasig. The important business district of Binondo lies directly opposite the old walled town. The centre of foreign trade, and especially that which is in the hands of Europeans, is the street known as the Escolta. The Chinese have their numerous shops and bazaars along the Rosario which runs parallel to the river. The district beyond Binondo, and extending along the bay, is a mean portion of the city occupied largely by native Malays. The better residences and villas are to be found in the suburbs, Santa Cruz, Quiapo and San Miguel. Still further inland lies the suburb of Malacamang which contains the summer palace formerly occupied by the Spanish Governor-General. Malolos, where the insurgents established their government in June, is situated on the railway, about 28 miles from Manila, and has a population of some 15,000. Other neighboring towns are Malabon, and the adjoining suburban town of Caloocan, the latter being seven miles north of Manila. Malate, which has been often mentioned in dispatches, lies on the road from Cavité to Manila at a distance of a mile and three-quarters from the walled city.

History.—For an account of the important events of the war down to the capture of Manila, see the article SPANISH-AMERICAN WAR, and for a discussion of some aspects of the colonial problem, see the article UNITED STATES (paragraphs on History). Affairs were complicated in the Philippines by the insurrection of the natives. On June 12, 1898, Aguinaldo established an insurgent government and declared himself President. Three weeks later the Philippine Republic was proclaimed. Soon after the organization of the cabinet on July 21 an appeal was addressed to European powers for the recognition of the new republic. The insurgents disregarded the armistice proclaimed by President McKinley, and continued the warfare against the Spaniards. As time went on the antagonism of the insurgents toward the United States forces appeared to be on the increase. In September it was reported that the former had gained possession of all the island of Luzon, with the exception of the province of Albay. The insurgents had captured a large number of Spanish prisoners and were accused of subjecting them to inhuman treatment; but Admiral Dewey investigated the matter and reported that they were as well treated as could be expected under the circumstances. The efforts of General Otis, who was in command of the American troops during the latter part of the year, did not succeed in inducing the insurgents to release these prisoners. In the meanwhile, early in November, the insurgents seized suburbs of the city of Iloilo, the capital of the island of Panay, having a population of some 10,380. They were about to make an attack upon the city itself, but on December 24 the Spanish General, Rios, surrendered to the insurgents. On the same day an American naval expedition, under General Miller, reached Iloilo for the purpose of protecting American interests there. An account of Aguinaldo's protest against the action of the United States is given in the article UNITED STATES (q. v.). On December 29, a new insurgent cabinet was formed whose members were pledged to insist upon the independence of the islands. The year closed with the Philippine question still at a most critical stage.

PHILOLOGICAL ASSOCIATION, AMERICAN, founded in 1869, has about 485 members. President, Clement L. Smith, Harvard; Secretary and Treasurer, Herbert W. Smith, Bryn Mawr.

PHILOLOGY. The year's work in comparative philology and the general direc-



THE PASIG RIVER AT MANILA.

tion it has taken are best illustrated by the bibliography. From the nature of the case, however, this is much better calculated to show tendencies than absolutely rounded-out results, since almost all extended philological work progresses slowly. A given year's record is, in this way, to no small extent a chronicle of fascicles and single parts, instead of completed wholes. Such a record, nevertheless, shows unmistakably the relative progress of the science as a whole and the trend of investigation within it. The contribution of the year has been altogether a respectable one, although there are few works that may absolutely be termed "epoch-making."

The fundamental growth of certain phases of the science of Indo-European philology is sufficiently well exemplified by the appearance on the dividing line between 1897 and 1898 of the concluding half of the first volume of a new edition (2. *Bearbeitung*) of Brugmann's *Grundriss der vergleichenden Grammatik der indogermanischen Sprachen* (Strassburg), with the name of B. Delbrück also on the title page. This is a complete revision of the original first volume which appeared in 1866, also as *Einleitung und Lautlehre*. The same material shows an increase of more than four hundred pages in its treatment, which is accounted for in the preface: (1) by the increase, in breadth and depth, of investigation in the several parts of the phonology; (2) by the inclusion of Albanian among the languages considered (in the first edition only taken into account in discussing the development of the Indo-Germanic palatal and guttural explosives); (3) by the addition of preliminary remarks on sound-physiology. The phonology has been particularly extended by the greater part ascribed to accent; and by the amplification of those processes characterized as combinatory sound-changes. Hermann Paul's important work: *Prinzipien der Sprachgeschichte* (Halle), first edition 1889 (see article PHILOLOGY, *International Cyclopædia*, Vol. XI) appeared this year in a third edition.

Aryan.—In Aryan, important for its general as well as its special bearing is C. Uhlenbeck: *A Manual of Sanskrit Phonetics* (London). The same is true of J. von Negelein; *zur Sprachgeschichte des Veda. Das Verbalssystem des Atharva-Veda, ischen Philologie* (Strassburg), under the editorship of W. Geiger and Ernst Kuhn, has proceeded to the extent of two fascicles more of part 2, Vol. I.

Greek.—In Greek appeared the third, and final volume of Otto Hoffmann: *Die Griechischen Dialekte* (Göttingen), containing "Der Ionische Dialekt, Quellen und Lautlehre." This work does for Greek what Conway's *Italic Dialects* (Cambridge, 1897) does for Latin, and is an important contribution to the history of the Greek language, which has yet to be written. E. Schweizer: *Grammatik der pergamenischen Inschriften. Beiträge zur Laut- und Flexionslehre der gemeingriechischen Sprache* (Berlin) is a *Preisschrift* of the University of Zürich. A contribution to the history of the language is A. Ludwich: *Die Homervulgata als voralexandrinisch erweisen* (Leipzig). An addition to subsidia is a translation by H. St. J. Thackeray of Blass's well-known grammar (1896), which now appears as *Grammar of New Testament Greek* (London). Here may also be mentioned F. Blass: *Philology of the Gospels* (London), which makes its original appearance in English. New texts of Greek authors are: F. H. M. Blaydes: *Aeschyli Agamemnon* (Halle), with critical notes and commentary; Bruno Keil: *Aelin Aristiæis Smyrni, quæ supersunt omnia* (Berlin), vol. 2, *Orationes*, which precedes the first volume in order of appearance; three parts of the *Commentaria in Aristotelem græca* (Berlin), under the auspices of the Prussian royal academy, viz., A. Busse: *Ammonius; In Aristotelis de interpretatione Commentarius Philoponi (olim Ammonii) in Aristotelis Categorias Commentarium*; M. Wallis: *Alexandria quod fertur in Aristotelis Sophistoclos elenchos commentarium*; U. P. Boissevain: *Dionis Cassii, historiarum Romanorum quæ supersunt* (Berlin), vol. 2, containing Books 41-60; H. von Arnim: *Leben und Werke des Dio von Prusa* (Berlin); N. Wecklein: *Euripides fabulæ* (Leipzig), parts 4-7 of vol. 1, containing the *Electra*, *Ion*, *Helene*, *Cyclops*, and parts 1-2 of vol. 2, containing the *Iphigenia Taurica*, *Supplices*; Grenfell and Hunt: *Menander's Georges* (Oxford), a revised text of the so-called Geneva fragment first published by Nicole of Geneva, to whom the papyrus belongs, containing text, reconstruction, notes, and a provisional translation; J. G. Frazer: *Pausanias's Description of Greece* (London), a translation with a commentary in 6 vols., without text; Carl Hude: *Thucydidis historiae, ad optimos codices denuo ab ipso collatus* (Leipzig), vol. 1, books 1-4, of a new collation of the whole of Thucydides' *Histories*. In criticism have appeared: P. Corssen: *Die Antigone des Sophocles, ihren theatralische und sittliche Wirkung* (Berlin), a monograph; Victor Terret: *Homère. Etude historique et critique* (Paris); J. Geffchen: *Studien zu Menander* (Hamburg), a programme; J. J. Hartman: *De emblematis in Platonis textu obviis* (Leyden), a monograph; P. E. Le-grand: *Etude sur Théocrite* (Paris); C. Wunderer: *Polybios-Forschungen. Sprichwörter und Sprichwörtliche Redensarten bei Polybios* (Leipzig). The extraordinary papyri finds made in the winter of 1896-97 in the ruins of Oxyrhynchus, in Central Egypt, by Grenfell and Hunt, were first reported in the *Achæological Report* of the

Egypt Exploration Fund for 1896. Parts of this great mass of material were given to the world by their discoverers in 1897, viz., the much discussed *Logia*, a collection of extra-canonical sayings of Jesus, and a fragment of Thucydides, Book IV. Grenfell and Hunt now publish: *The Oxyrhynchus Papyri* (Oxford), Part I, containing texts, translations, and notes, with eight facsimile plates. The volume comprises: theological pieces, besides the *Logia* several verses from the beginning of Matthew in a MS. of the third century, the oldest specimen of a New Testament MS. extant; New classical pieces, of which No. 7 contains fragments of five Sapphic strophes in a MS. of the third century; fragments of extant classical authors; Latin fragments; Greek documents of the first four centuries dealing with details of public and private life; papyri, of the sixth and seventh centuries; and a description of unprinted documents. In connection with this work the *Classical Review* calls attention to the fact that the scholar now chiefly looks to Egypt for fresh additions to classical material and for new evidence upon existing texts. New finds are constantly being reported. Mention also belongs here of the renaissance of the poet Bacchylides of whom the *editio princeps*, by F. G. Kenyon, appeared in 1897: *The Poems of Bacchylides. From a Papyrus in the British Museum* (Oxford), followed the same year by an *Autotype Facsimile* (Oxford). The present year has seen the issue of a considerable literature on this author; F. Blass: *Bacchylides carmina cum fragmentis* (Leipzig); H. Jurenka: *Die neugefundenen Lieder des Bakchylides* (Wien), containing text, translation, and commentary; R. C. Jebb: *Bacchylides, The new poems and fragments* (Cambridge), a revised text, introduction, notes, and commentary; E. Poste: *Bacchylides. A prose translation* (London); A. M. Desrousseaux: *Les poèmes de Bacchylide de Céos traduits du Grec d'après le texte récemment tiré d'un papyrus d'Égypte* (Paris); U. von Wilamowitz-Moellendorf: *Bakchylides* (Berlin).

Latin.—In Latin, new texts of Latin authors are: O. Keller and J. Kaeussner: *Q. Horatii Flacci opera* (Copenhagen), with a commentary by C. F. Linderstrom-Lang, in part; Arthur Palmer: *P. Ovidi Nasonis Heroides* (Oxford), which also contains the Greek translation of Planudes; W. M. Lindsay: *The Codex Turnebi of Plautus* (Oxford), contains, besides the MS. material, the newly found Bodleian marginalia here reproduced in collotype facsimile; F. Vollmer: *P. Papinii Statii silvarum libri* (Leipzig); H. Furneaux: *Cornelii Taciti vita Agricola* (Oxford), contains an introduction, notes and map; R. Agahd: *M. T. Varronis, Antiquitatum rerum divinarum libri I, XIV, XV, XVI* (Leipzig); I. Cholodniak: *Carmina sepulcralia latina* (Petropoli); O. Ribbeck: *Fragmenta scanica Romanorum poesis* (Leipzig) Vol. 2. In criticism have appeared: M. Rothstein: *Propertius Elegein erklärt von M. R.* (Berlin), 2 vols.; A. Kunze: *Sallustiana Die Stellung, Wiederholung und Weglassung der Präpositionen* (Leipzig).

Balto-Slavonic.—In Baltic-Slavonic, a second, revised and augmented, edition appeared of M. J. A. Voelkel: *Litanisches Elementarbuch* (Heidelberg). O. Broch: *Studien von der Slovakisch-kleinrussischen Sprachgrenze im östlichen Ungarn* (Christiania) is a monograph.

Celtic.—In Celtic, a tenth fascicle appeared of A. Holder: *Altceltischer Sprachschatz* (Leipzig).

Romance.—In Romance the *Grundriss der romanischen Philologie* (Strassburg), under the general editorship of Gustav Gröber, the first fascicle of which appeared as long ago as 1886, has progressed along satisfactory lines in that we have now the whole of Gröber's History of French Literature. Of L. Petit de Julleville: *Histoire de la langue et de littérature française* (Paris), Vol. VI, appeared, as did Vol. II, of G. Körting: *Formenlehre der französischen Sprache. Der Formenbau des französischen Nomens* (Paderborn). Vol. I., the Verb). A volume enthusiastically received was: Antoine Thomas: *Essais de philologie française* (Paris), a collection of articles that had for the greater part appeared in various reviews. Bearing upon a special phase of the language is E. Deschanel: *Les déformations de la langue française* (Paris).

In Provençal, C. Appel: *Poésies provençales inédites, tirées des manuscrits d'Italie* (Paris), is an addition to the author's *Provenzalische Chrestomathie* (Leipzig, 1895).

Jac. Ulrich: *Altoberengadinische Lesestücke* (Zürich), with a glossary, is a contribution in a not overworked field.

In Spanish, Egidio Gorra: *Lingua e letteratura spagnuola delle origini* (Mailand), contains the phonology and morphology, together with old Spanish texts and a vocabulary.

Germanic.—In Germanic, the second edition, revised and enlarged, of the *Grundriss der germanischen Philologie* (Strassburg), under the editorship of Hermann Paul, begun in 1896, has proceeded to the extent of several fascicles, although the work is not yet complete. Several articles in the second edition of the *Grundriss* have appeared during the year separately: O. Behagel: *Geschichte der deutschen Sprache*; A. Noreen: *Geschichte der nordischen Sprachen*; Jan te Winkel: *Geschichte der niederländischen Sprache*; E. Mogk: *Germanische Mythologie*; R. Symons: *German-*

ische Heldensage. The reprint of Jacob Grimm's *Deutsche Grammatik* (Gütersloh), by Roethe and Schroeder has been completed. To the list of subsidia for students, of which in the past there has been a lack, is to be added: F. Dieter: *Laut- und Formenlehre der altgermanischen Dialekte* (Leipzig), first part, containing Germanic, Gothic, Old Norse, Old English, Old Saxon, and Old High German. W. Luft: *Studien zu den ältesten germanischen Alphabeten* (Gütersloh) is also of general Germanic interest.

Specifically German are: Steinmeyer und Sievers: *Die althochdeutschen Glossen* (Berlin), the fourth and last volume of a most important *Quellenwerk* containing glosses in alphabetical order, and "Adespota," or those whose Latin sources it has been impossible to determine. P. Piper: *Otfried und die übrigen Weissenburger Schreiber des 9. Jahrhunderts* (Frankfurt a. M.), contains thirty folio pages in photolithographic facsimile of O. H. G. MSS. H. Geffenken: *Lex Salica zum akademischen Gebrauch* (Leipzig) in a way belongs here. On German dialects have appeared: E. Maurmann: *Grammatik der Mundart von Mülheim a. d. Ruhr*; O. Heilig: *Grammatik der ostfränkischen Mundart des Taubergrundes* (Leipzig); W. von Gutzeit: *Wörtersehatz der deutschen Sprache Livlands. Nachträge zu A—V* (Riga).

In Anglo-Saxon, the second half of Vol. III, of the Wülcker revision of Grein's *Bibliothek der angelsächsischen Poesie* (Leipzig) has appeared, and the second half of Vol. IV of the continuation, by the same well-known scholar, of Grein's *Bibliothek der angelsächsischen Prosa* (Leipzig). In criticism are: T. Arnold: *Notes on Beowulf* (London); F. Brincker: *Germanische Alterthümer in dem anglesächsischen Gedichte "Judith"* (Hamburg).

In Old Norse, as Vol VII of the *Saga-Bibliothek*, has appeared, E. Kölbing: *Ivens Saga* (Halle). As Vol. III of the *Northern Library: Hamlet in Iceland*, i. e., the *Ambales Saga*, has been edited and translated by I. Gollancz (London). B. Kahle: *Isländische geistliche Dichtungen des ausgehenden Mittelalters* (Heidelberg) prints much new material. A valuable addition to existing subsidia is the second part of A. Noreen: *Altschwedische Grammatik* (Halle), which contains the Consonants (first part, Sonants, 1897). E. Brate: *Fornnordisk metrik* (Stockholm) is a monograph.

Lexicography.—In lexicography substantial contributions have been made during the year. The latter part of the century has been distinctly in the modern languages an epoch of dictionary making and in several countries there are notable enterprises of this kind under way. The great dictionary of the German language, which its projectors, Jacob and Wilhelm Grimm, began to issue in parts as far back as 1854, is the prototype in this field which the others have more or less closely followed. The *Deutsches Wörterbuch* is in the hands of a corps of editors under the direction of Moritz Heyne, who has been connected with it since 1867. The present condition of the dictionary is a torso, in that parts are at hand ranging through the alphabet from A to V. Portions, only, of G, S, T, V, have appeared; and nothing of U, W, X, Y, Z. The year's contribution to the work is: Vol. IX, three fascicles, Vol. IV, one fascicle. Other German dictionaries are: F. Kluge: *Etymologisches Wörterbuch der deutschen Sprache* (Strassburg) in a sixth edition, revised and enlarged, which brings this indispensable work into accord with the present stage of etymological investigation along broad lines. Of the *Schweizerisches Idiotikon. Wörterbuch der Schweizer-deutschen Sprache* (Frauenfeld), begun in 1881 with F. Staup as principal editor, appeared during the year fascicles 35, 36, 37 of Vol. IV. This takes into account literary sources as well as the spoken dialects. Of the *Wörterbuch der elsässischen Mundarten, im Auftrage der Landesverwaltung von Elsass-Lothringen* (Strassburg), under the joint editorship of E. Martin and H. Lienhart, fascicles 3 and 4 have appeared.

In English, the *Oxford English Dictionary*, under the editorship of James A. H. Murray, as befits the magnitude of the task, like the Grimm dictionary also drags its slow length along. The first part to be issued appeared in 1884. The present status of the work is A, B, C, D, E, F completed, with parts of G and H. The year's contribution is *Gaincope—Germanizing, H—Heel*. The statistics of the completed letters are as follows:

	Main Words.	Special Combinations explained under Main Words.	Subordinate Words.	Total.
A.....	12,183	1,112	1,828	15,123
B.....	10,049	3,180	2,902	16,131

	Main Words.	Special Combinations explained under Main Words.	Subordinate Words.	Total.
C	21,295	3,461	4,539	29,295
D	13,478	1,480	2,099	17,057
E	9,249	923	1,813	11,985
F	9,339	2,849	1,419	13,607
	75,593	13,005	14,600	103,198

The remainder of the work, to the end of the alphabet, is in an advanced state of preparation.

Other English dictionaries are: Skeats's *Etymological Dictionary of the English Language* (Oxford) in a third edition. Kluge and Lutz: *English Etymology*, is a selection of English etymologies in alphabetical order to serve as an introduction to the study of historical grammar. The *English Dialect Dictionary* (London), edited by Joseph Wright, advanced through *chuck*—*cyut*, which formed pt. V., and completed Vol. I. The *Anglo-Saxon Dictionary* (Oxford), based on the manuscript collections of Joseph Bosworth, edited and enlarged by F. N. Toller, was completed by the issue of the last fascicle. The book adds the prose vocabulary to the poetical and includes prose citations. Belonging in the field of both German and English is an abridgement of Muret's: *Encyclopædisches Wörterbuch der englischen-deutschen Sprache* (Berlin), the first part of which, English-German, appeared in 1897. The book shares the excellences and the defects of the larger work, which has been described as a German version of the Century Dictionary, in that it frequently translates its definitions bodily from that work.

In French, the *Dictionnaire général de la langue française* (Paris), under the editorship of Hatzfeld, Darmsteter, and Thomas, has progressed during the year from *paniculé-regarder*. Other additions to Romance lexicography are: Godefroy: *Dictionnaire de l'ancienne langue française* (Paris) of which four fascicles have appeared during the year, from *estendu* to *lictenterie*. Of E. Levy: *Provençalisches Supplement-Wörterbuch* (Leipzig), (the first volume, A—C, 1894), two fascicles of the second volume appeared.

In Dutch, the great *Woordenboek der Nederlandsche Taal* (Hague), under the direction of M. de Vries and a corps of editors, is well under way, but is still in a fragmentary state. It was begun in 1882.

In Sweden, the *Orbog öfver svenska språket* (Lund), begun in 1893, under the direction of the Swedish Academy, has not advanced beyond the first letter of the alphabet which is still incomplete. The contribution of the year was: *Allsidighet*—*an*.

Special dictionaries to Latin authors are: Segebade and Lommatzsch: *Lexicon Petronianum* (Leipzig), important from the position of Petronius as a principal source for popular Latin. F. Fügner: *Lexicon Livianum* (Leipzig) has been completed, by the appearance of fascicles 8, through A—B, which form Vol. I of the work.

An important work for the whole Indo-European family is: C. C. Uhlenbeck: *Kurzgefasstes etymologisches Wörterbuch der altindischen Sprache* (Amsterdam), of which the first volume, *a—paç* has appeared.

Paleography and Epigraphy.—In Latin, the *Corpus inscriptionum latinarum* (Berlin), under the editorship of Mau and Zangemeister, has been augmented by part I of Vol. IV, supplement. Of E. Chatelain: *Paléographie des classiques latines* (Paris), fascicle 13 is issued. New subsidia are, C. Wessely: *Schrifttafeln zur älteren lateinischen Paläographie* (Leipzig), which contains twenty tables and twelve pages of text; W. M. Lindsay: *Handbook of Latin Inscriptions* (London).

In Greek, the *Corpus inscriptionum etruscarum* (Leipzig), under the editorship of Danielsson and Pauli, has advanced by fascicles 5—8. Of *Inscriptiones graecae insularum maris Aegaei* (Berlin), published by the Prussian Royal Academy, fascicle 3 has been issued. The first fascicle of a new, second, series of Greek law inscriptions is: *Recueil des inscriptions juridiques grecques. Texte, traduction, commentaire* (Paris), under the editorship of Darest, Haussoullier, and Th. Reinach. Of

Collitz and Bechtel's important *Sammlung der griechischen Dialekt-Inschriften* (Göttingen), the first fascicle of the second half of Vol. III contains R. Meister: *Die Inschriften von Lakonien, Tarent, Herakleia (am Siris), und Messenien*. Of W. Lanfeld: *Handbuch der griechischen Epigraphik* (Leipzig), the first fascicle of Vol. II contains the Attic inscriptions.

In Aryan, a second, revised edition of Georg Bühler: *On the Origin of the Indian Brahma Alphabet* (Strassburg) appeared, the last work undertaken by its late author. It contains appendices on the origin of the Kharosthi alphabet and of the letter-numerals of the Brahmi.

That the scientific study of philology is a matter of live interest in America at the end of the century is evinced by the several series of studies, made up of monographs, that are issued with more or less regularity by various universities. Among them are: *Cornell Studies in Classical Philology*; *Harvard Studies in Classical Philology*; ditto *Studies and Notes in Philology and Literature* (Mod. Lang. Depts.); ditto *Oriental Series* (Indo-Iranian Dept.); University of Chicago *Studies in Classical Philology*; *Publications of the University of Pennsylvania*; *Series in Philology, Literature, and Archaeology*.

The current volumes of philological periodicals in America are as follows: *American Journal of Philology* (Baltimore) XIX; *Modern Language Notes* (Baltimore) XIV; *Journal of Germanic Philology* (Bloomington, Ind.) II; *Americana Germanica* (Philadelphia) II.

Publications of the Modern Language Association of America (See Modern Language Association of America) are contained in Vol. XIII, New Series Vol. VI, which like its predecessors is made up of a number of monographs. The American Philological Association (see PHILOLOGICAL ASSOCIATION, AMERICAN), issues its yearly volume, 29, of *Transactions and Proceedings*.

PHILOSOPHICAL SOCIETY, AMERICAN, founded in Philadelphia in 1743, has 200 resident and 300 non-resident and foreign members. Its object is to promote useful knowledge. President, Frederick Fraley, Philadelphia; Secretaries, L. Minis Hays, P. Frazer, Frederick Prime, and Samuel P. Satler. Headquarters, 104 South Fifth street, Philadelphia.

PHOSPHATE. Figures are not obtainable for the year 1898, but the production of Tennessee is nearly three times what it was in 1897, while South Carolina, unable to compete with the Tennessee production, fell off, but that of Florida increased. For Florida the year 1898 was a successful one, as the production amounted to 360,305 long tons as against 350,277 in 1897. The output was hardly more than sufficient however, to meet the foreign demand, the Florida product having been sent to practically all parts of the world except India and Africa.

PHOSPHORUS. In 1875 two chemists reported that they were able to obtain liquid phosphorus by a given method and that it had peculiar properties when in that condition. This statement has been recently called in question by F. Venable and A. Belden, who have shown by repeating the original experiments that these former statements were incorrect and that liquid phosphorus probably cannot exist, unalterable in the air as was claimed by these earlier writers.

PHOTOGRAPHIC ASTRONOMY. See ASTRONOMY.

PHYRGIAN ROCK-TOMBS. See ARCHÆOLOGY.

PHYSICS. The purpose of this article is to give a brief account of the most interesting and important advances that have been made in physics during the calendar year 1898. Each subject is treated in a paragraph by itself. To assist those who may desire to pursue the subject further, references are given to the places of original publication. At the end of the article will be found an explanation of the abbreviations used in these references.

THEORIES OF MATTER.

Potential Matter.—Professor Arthur Schuster of Manchester, England, has put forth a fascinating theory of matter by which gravitation can be explained. It is an amplification of a theory originally suggested by Lord Kelvin. Kelvin's theory supposes that the universe is filled with a perfect fluid which is being either created or destroyed at the surface of each atom or elementary particle of matter at a rate which is proportional to the mass of the atom, and also being destroyed or created at an infinite distance at the same rate at which the opposite process is taking place on all the matter in the universe. In the science of hydrodynamics, a point at which a fluid is being created is called a source, and a point at which it is being destroyed is called a sink. It is true we have no experience of such things in nature, but if such points existed, they would behave so far as gravita-

tion is concerned, like the existing particles of matter. Professor Schuster supposes that the matter we are acquainted with is composed of such sources (or sinks), and that there is somewhere else in the universe another collection of matter composed of the opposite, that is sinks (or sources). The atoms of each kind would attract, according to Newton's law of gravitation, all other atoms of the same kind, but would repel with an equal force all atoms of an opposite kind. For this reason if any other atoms of this opposite kind had ever existed on our earth or in our solar system, they would long ago have been repelled and would have disappeared. However, the presence of some of these opposite kinds of atoms might explain the peculiar repulsion from the sun observed in the case of the tails of comets. It might also be the explanation of the rotary motion of the solar system which could have been obtained by the reaction of repelling a large quantity of this opposite kind of matter. The large velocity of some of the fixed stars may also be explained in the same way. Professor Schuster calls this speculation a "holiday dream," but it surely deserves a place among such speculations as the well-known vortex theory of matter of Lord Kelvin, or Le Sage's gravitation hypothesis. (*Nature*, 58, 367, 1898.)

Vortex Motion.—W. M. Hicks has discovered by mathematical analysis some new kinds of vortices which are possible in a perfect fluid. A perfect fluid is defined by the physicist as being one that has no viscosity, so that water is more nearly perfect in this sense than molasses, and ether more nearly perfect than water. Gases are also more nearly perfect than liquids. So far as we know, however, there is no such thing as a perfect fluid in nature. Lord Kelvin in 1867 proposed his celebrated hypothesis that the ultimate atoms of matter are vortices in a perfect fluid. (*Proc. Roy. Soc. Edinburgh*, 6, 94, 1867.) According to this hypothesis, space is filled with a perfect fluid. Vortex rings exist in this fluid similar to those smoke rings blown in the air by a smoker, or by a locomotive, and each of these vortex rings is an atom of matter. Some of the most important and fundamental properties of atoms are possessed also by such vortex rings. This paper of Hicks deals with a new kind of vortex ring, or rather vortex structure, which could exist in a perfect fluid, and that might be described by the name spiral vortex. These new vortices have the remarkable property of existing in periodic families or systems which suggest the periodic properties of the elements, as discovered by Mendeleef, and others. Supposing for a moment that the atoms of matter are really formed of such vortices in some perfect fluid, it is even possible to find among these vortices some which suggest the properties of metals, and others which suggest the properties of the non-metals, and among the metals to distinguish between the alkali group, the calcium group, and the others. This discovery of Mr. Hicks seems to have opened a most intensely interesting field for mathematical physicists. (*Proc. Roy. Soc.* 62, 332, 1898.)

DYNAMICS.

Gravitation Constant and Mean Density of the Earth.—F. Richarz and O. Krigar-Menzel have finished a series of experiments on this subject begun in 1884. The size of the earth and therefore its volume can be determined by geodetic measurement. If its mass is known, its mean density is simply its mass divided by its volume. Its mass is measured by comparing the gravitational attraction of the earth on a certain mass with that exerted by a much smaller mass in the laboratory, assuming Newton's law of universal gravitation to hold in this case. This last measurement involves finding the value of the gravitational constant, which is the force, measured in dynes, with which two very small particles each having a mass of one gram and distant from each other one centimeter, would attract each other. The method used by the experimenters mentioned consisted in using a balance which had under each pan, a second pan suspended at a distance of 226 cm. An enormous mass of lead weighing more than 100,000 kg. and whose volume was about 9 cubic meters, could be placed between the upper and lower pans, or removed if desired. By a method of double weighing in the upper and lower pans, with the lead mass in position and with it removed, the effect of the lead mass on a small weight was compared with the effect of the earth. From these measurements, the constant of gravity was found to be

$$(6.685 \pm 0.011) \times 10^{-8} \frac{\text{cm}^3}{\text{g} \cdot \text{sec}^2}$$

This is the value of k in the usual equation representing, according to Newton's law, the attraction between two particles m and m' at a distance r .

$$= k \frac{mm'}{r^2}$$

This gives for the mean density of the earth the value

$$5.505 \pm 0.009 \frac{\text{g}}{\text{cm}^3}$$

The results for this obtained by some previous experimenters are as follows:—

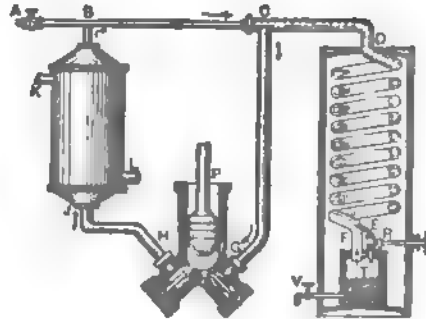
Cavendish (<i>Phil. Trans.</i> 88, 469, 1798).....	5.45
J. H. Poynting (<i>Proc. Roy. Soc.</i> 28, 2, 1878).....	5.4934
C. V. Boys (<i>Nature</i> , 50, 330, 1894).....	5.5270
(<i>Wied. Ann.</i> 66, 177, 1898.)	

HEAT.

The Boiling Point of Ozone.—L. Troost has measured the boiling point of ozone under atmospheric pressure. He finds it to be -119°C . A measurement by Olszewski in 1887 gave -106°C . To measure the temperature, Troost used a thermocouple of iron-constantan. He calibrated this so that he could read temperatures within half a degree by immersing it in melting ice for an upper limit, and liquid oxygen for a lower limit with a number of points determined by other means in between. Constantan is an alloy containing 50 per cent. nickel and 50 per cent. copper. (*La Nature*, 26, 113, 1898.)

Liquid Air.—Liquid air is not a new product, having been first produced in sufficient quantity to observe its properties, by Wroblewski, in 1885. During the last few years, however, the methods of producing it have been improved, and there has been recently considerable discussion as to its properties and possible uses. Dr. Carl Linde, of Munich, was the first, in May, 1895, to produce liquid air on what may be called a commercial scale. When any gas is allowed to expand against pressure, it is cooled very greatly, and this was one of the properties which it was at first proposed to use in liquefying air, but mechanical difficulties were found. Lord Rayleigh has recently published a note in which he suggests the use of turbines to absorb the energy of the air while it is expanding, and he says that there must be some way possible of making use of the great cooling caused by expansion against pressure. This, however, is not the way in which Linde produces liquid air, and the method of C. E. Tripler of New York is probably the same as Linde's. Linde's method is to allow the air, when highly compressed, to expand through a small orifice. If it were a perfect gas it would be at the same temperature as before, as was shown a long time ago by Joule. Air, however, is not a perfect gas, and it is found that when it passes through a small orifice from a place where the pressure is high to one where it is low, it cools about one-quarter degree centigrade for each difference of one atmosphere in the pressures on the two sides of the orifice. It is this cooling effect, which seems very small, that is made use of by Linde, and doubtless also by Tripler. The machinery is arranged in such a way that atmospheric air is first highly compressed. This would naturally tend to heat it very much, but its temperature is kept down by passing it through a coil of pipes surrounded by a water-bath.

When it is very greatly compressed, it is allowed to escape through an orifice, at the end of a coil of pipes which is arranged in such a way that the first cooling effect produced tends to cool the air that has not yet reached the orifice. In this way the cooling effect is made continuous and cumulative. The diagram illustrates Linde's apparatus in its simplest form. P is a pump which compresses air from G into the cooler J K L. This compressed air goes through the inner one of two concentric pipes, and finally escapes at a small orifice at R into the chamber T, suffering a drop in temperature. It returns from T through the outer one of the two concentric pipes and returns to the pump again. Any air that is liquefied is drawn off from T. Its

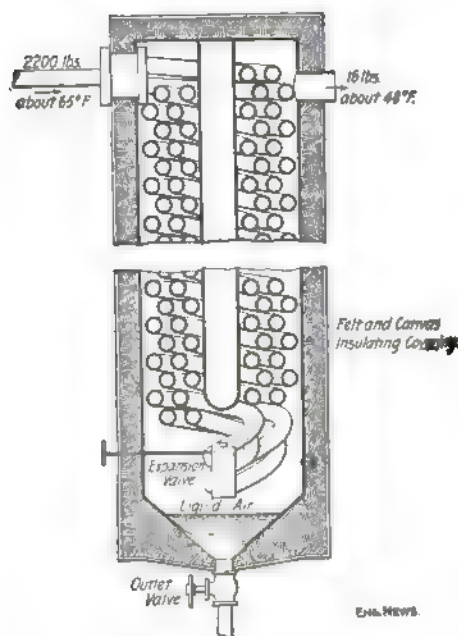


Linde's Liquid Air Machine in its simplest form.

(From *Journal of the Society of Arts*.)

place in the apparatus must be supplied by an auxiliary pump, not shown in the diagram, which forces air in at A. Linde's present form of apparatus is more complicated than this, but is essentially the same in principle. Dr. Linde begins with a pressure of 200 atmospheres and he lets the air escape through an orifice into a place where the pressure is only 50 atmospheres. Tripler does not use so great an initial pressure,

using only about 150 atmospheres. His apparatus probably is the same in principle as Linde's, as is seen from a diagram of his final coil of pipes, or liquefier.



Sketch illustrating principle of Tripler's Liquefier.

Liquid air is a pale blue liquid, very much resembling water. Its density is about 0.9, water being 1. Its boiling point at atmospheric pressure is -191.4°C . It is a mixture chiefly of oxygen and nitrogen. Oxygen boils at -181.4°C . and nitrogen boils at -194.4°C ., 13° lower, so that in the liquid mixture of oxygen and nitrogen, the nitrogen continually boils off faster than the oxygen and the mixture remaining gets continually richer and richer in oxygen.

Liquid air is very useful for purely scientific purposes, to produce low temperatures when the properties of matter at those low temperatures are being investigated. Practically, it is said to be useful as an explosive, when mixed with some organic substance. It is also claimed that it will be of use as a refrigerating agent. Tripler proposes to use it as a motive power. If liquid air is placed in a closed vessel, and exposed to the ordinary temperature, it will soon generate an enormous pressure, in precisely the same way that a quantity of water would if placed in a closed boiler, and then heated over a fire. There is no doubt that it can be used for all of the purposes mentioned above, the only question at present being as to its cost compared with the means now used.

For further particulars about the liquefaction of air, low temperatures produced thereby, etc., see the separate article on LIQUID AIR.

The Liquefaction of Hydrogen.—James Dewar, Professor of Chemistry at the Royal Institution, London, was the first to succeed in liquefying any considerable quantity of hydrogen, at that institution on May 10, 1898. At this time he obtained about 20 cc. of the liquid. It appeared to be clear and colorless, showing no absorption spectrum, and the meniscus was as well defined as in the case of liquid air. He measured its boiling point under atmospheric pressure by means of a platinum resistance thermometer and found it to be -238°C ., or 35° absolute. This assumes that the resistance of a piece of platinum wire varies according to the same law at this low temperature as it does at considerably higher temperatures at which it can be compared with an air or hydrogen gas-thermometer. This temperature, -238°C . is 4.5° higher than the value obtained by Olszewski for the same boiling point, in 1895. Olszewski obtained a very small quantity of liquid hydrogen by letting it expand very suddenly and adiabatically.

Dewar found that the density of liquid hydrogen was approximately rather less than .07, or one fourteenth that of water. The ratio of the density of hydrogen vapor at its boiling point to the density of the liquid is as 1:100. In the case of oxygen this is 1:255. Dewar thinks it is not probable that by making use of the boiling of liquid hydrogen in a vacuum, we should ever in our laboratories be able to approach nearer to the absolute zero than 20°C .

In liquefying hydrogen, Dewar started with the hydrogen cooled to -205°C ., and under a pressure of 180 atmospheres, and he allowed it to escape continuously from the nozzle of a coil of pipe at the rate of about 10 cubic feet to 15 cubic feet per minute, in a vacuum vessel double-silvered and of special construction, all surrounded with a space kept below -200°C . Liquid hydrogen commenced to drop from this vacuum vessel into another doubly isolated by being surrounded with a third vacuum vessel. In about five minutes 20 cc. of liquid hydrogen were collected. The yield of liquid was about 1 per cent. of the gas. (*Nature*, 55, 58, 1898. *Am. J. Sci.* (4) 6, 96, and 361, 1898. *Phil. Mag.* (5) 45, 543, 1898. *Chem. News*, 77, 261, 1898.)

Ratio of the Specific Heats of Gases.—O. Lummer and E. Pringsheim have measured the ratio of the specific heats of several gases by a method analogous to that of

Clement and Desormes. The number of calories required to raise the temperature of one gram of the gas one degree centigrade, when the pressure is kept constant and the volume is allowed to increase, is called the specific heat at constant pressure. The number of calories required, however, when the volume is kept constant, and the pressure therefore allowed to increase, is called the specific heat at constant volume. It is less than the former. These two specific heats are usually denoted by C_p and C_v . The ratio of the former to the latter is usually denoted by γ so that

$$\gamma = \frac{C_p}{C_v}$$

A knowledge of the value of γ frequently throws light on the nature of the molecule of the gas. The experimenters mentioned allowed the slightly compressed gas to expand adiabatically, that is, without receiving heat from the surrounding substances. This was accomplished by the suddenness of the expansion. The gas of course cooled slightly, and the fall in temperature from the initial temperature T_0 to the final temperature T_1 on the centigrade scale was measured by the change in the electrical resistance of a strip of platinum only 0.006 mm. thick suspended in the gas. The initial pressure P_0 , and the final pressure P_1 , which was the same as the atmospheric pressure, were also measured, and the value of γ was calculated from the formula

$$\left(\frac{T_0 + 273}{T_1 + 273}\right)^\gamma = \left(\frac{P_0}{P_1}\right)^{\gamma-1}$$

Lummer and Pringsheim obtained the following results for

Air	1.4025
Oxygen	1.3977
Carbon dioxide.....	1.2995
Hydrogen	1.4084

(*Wied Ann.* 64, 555, 1898.)

Professor L. Boltzmann has written a paper discussing the conclusions drawn from the value of γ for gases, as to the complexity of the molecule. He calls attention to the fact that many of the conclusions arrived at from the value of this constant are true only of gases when they are in such condition that they closely approach to being perfect gases. He finally reaches the following conclusions from a consideration of the previous work on the subject.

1. The molecule of a perfect gas for which $\gamma = 1\frac{2}{3}$ should behave with respect to molecular impacts like a rigid sphere, which is probably not possible except for monatomic gases.

2. The molecule of a perfect gas for which $\gamma = 1.4$ behaves throughout an extensive range of temperature like two spheres rigidly connected together, which probably would not happen except for a gas whose molecule is diatomic.

3. Each molecule and even each atom is capable of vibration in its internal, or in its electrical structure, and consequently γ diminishes and becomes variable even for perfect gases at a high temperature. For triatomic and polyatomic gases, this takes place even at ordinary temperatures.

4. For an imperfect gas which obeys the law of Van der Waals, γ is always smaller than for a perfect gas whose molecule has the same constitution and the same internal qualities. But the law of Van der Waals being but a first approximation, we do not know whether this theorem is true in general, and the theory of imperfect gases is at present entirely uncertain.

Experimenters should attempt new experiments to determine the value of γ for argon, mercury vapor, chlorine, air, hydrogen, etc., at temperatures and pressures as different as possible. It may be recalled here that the equation which expresses the law of perfect gases is $pV = RmT$, in which p = the pressure of the gas, v = the volume, R is a constant, m = the mass of the gas, and T = the absolute temperature. The modified equation proposed by Van der Waals in 1879 is

$$\left(p + \frac{a}{v^2}\right) (v-b) = R T$$

in which a and b are constants deduced from theoretical considerations, the other quantities having the same values as before, and the equation applying only to a unit mass of the gas. (*C. R.* 127. 1009. 1898.)

LIGHT.

Becquerel Rays.—Shortly after the discovery of Roentgen rays, it was discovered by Becquerel that the element uranium and its compounds emitted under ordinary circumstances, radiations which were very similar to Roentgen rays. (*C. R.* Vol. 122, pp. 420, 501, 559, 689, 762, 1,086, 1898, and Vol. 123, p. 855, 1896, and Vol. 124, pp. 438, 800, 1897.) The uranium radiations could pass through considerable thicknesses of metals and other substances opaque to ordinary light. They acted on a photographic plate. They discharged positive and negative electrification to an equal degree. They made gases temporarily conductors of electricity, and this power remained for a short time after the radiation had been removed. But unlike Roentgen rays, Becquerel found that the uranium radiation could be refracted and polarized, while this has never been done with Roentgen rays.

Becquerel rays have been the means during the past year, of the probable discovery of two new elements, by P. and S. Curie. (*C. R.* 127, p. 175, 1898.) They found that the mineral pitchblende, which has usually been considered to be an oxide of uranium, was much more powerful than uranium itself in giving out Becquerel rays. Except for this case, however, in all cases where uranium appeared as a part of a compound or mixture, the property of giving out rays seemed to be a property of the uranium itself, and was not affected by being in combination or mixture, except by the natural dilution which occurred. They therefore suspected that there might be in this mineral another element which had the same property as uranium in a greater degree. They attempted its separation therefore, using this radiating property to test the precipitates and residues, and they finally were able to obtain a sulphide which had the power of sending out these Becquerel rays 400 times as strongly as uranium. They also tried all known substances to see whether there was any hitherto known which had this power, but found there was none which had it in any degree except uranium and thorium, and possibly tantalum. They have therefore called this new element, if it should turn out to be such, by the name **POLONIUM** (q. v.). It seems to be very much like bismuth in its chemical properties. They were not able, however, to obtain any evidence of the existence of a new element by using the spectroscope. P. and S. Curie, together with G. Bémont, in pursuing these researches further (*C. R.* 127, 1,218, 1898) have discovered a second new substance in pitchblende which is even more active in emitting Becquerel rays than the supposed polonium. This element in its chemical properties is very much like barium. In the attempt at its chemical separation, they obtained chlorides which were not pure chlorides of the new element, but which nevertheless had a radiating power for Becquerel rays 900 times as powerful as uranium. The spectrum of these chlorides was examined by M. Demarçay who found a line in its spectrum which did not correspond with any known element, the wave-length being 3814.8 Angström units. On account of its great radiating power for Becquerel rays, the discoverers propose to call it "radium."

The Echelon Spectroscope.—Prof. A. A. Michelson, of Chicago University, has invented and constructed a new form of grating for use in a spectroscope. It is a transmission grating in which the distance apart of the lines is extremely large, as much as 5 or 8 mm. in some cases, and the total number of lines consequently very few, as few as 7 or 20 in some cases. The resolving power depends only on the product of the number of lines in the grating and the order of the spectrum observed. Using a grating of 20 lines, each 5 mm. thick, and observing the spectrum of the 5,000th order, we get a resolving power of 100,000. To avoid loss of light, a transmission grating was used consisting of a pile of glass plates of exactly the same thickness with their edges overlapping, like a succession of steps. With such a grating consisting of only 7 elements, the Zeeman effect could be easily observed with the D lines of sodium when the flame was put into a magnetic field. (*Astroph. J.* 7, 37, 1898.)

New Interferential Spectrometer.—A. Perot and Ch. Fabry have devised a new form of interferential spectroscope, in which, by means of fringes produced between two parallel glass plates, the lines in the spectrum can be observed, and their nature determined. They make use of the principle of partially silvering the glass so that with perpendicular incidence, as much light is reflected as is transmitted. They have applied it to investigating some lines in the spectrum of the elements and in some cases found results differing from those found by Michelson, who used a similar instrument called an interferometer. There is an advantage in using perpendicular incidence as then no polarization is produced in the reflected and transmitted light. (*C. R.* 126, 34 & 407, 1898, and *Astroph. J.* 7.60, 1898.)

A Simple Interpolation Formula for the Prismatic Spectrum.—J. Hartmann gives a new and improved interpolation formula for use with a prism spectroscope. It will be remembered that there are two principal ways of obtaining the spectra (see **SPECTRUM**) of the elements, or of the sun, or stars; by means of a glass prism, and by means of a diffraction grating. A diffraction grating consists of a highly

reflecting plane mirror, or one properly curved, of speculum metal (q. v.) on which are ruled by means of a diamond point a very large number of lines or grooves exactly equidistant and as many as 10,000 or 20,000 to the inch. When light from the sun falls on such a grating, it is not reflected as it would be from an ordinary mirror but is separated out into the light of various wave-lengths of which it is composed, the light of each wave-length being reflected in a different direction, and we get the solar spectrum. This spectrum is similar to that obtained when light is refracted through a glass prism. In the case of sunlight, the Fraunhofer lines caused by the absorption of light of the corresponding wave-lengths in the sun's or earth's atmosphere, can be seen by means of a grating just as in the case of a spectrum produced by a prism. If the spectrum produced by a grating is allowed to fall on a screen or is viewed by means of an eye-piece, the distances between the lines in different parts of the spectrum will be proportional to the differences between the wave-lengths of the light represented by these lines. With a concave grating, that is, one that is ruled on a concave spherical surface, this is rigidly true, but in the case of a plane grating, a comparatively small space must be considered at one time to have this law hold. This property of gratings is one of the things which gives them their superiority over prisms, as the law does not hold in the case of a spectrum produced by means of a prism. In the case of a prism spectrum, we cannot, as we can with a grating spectrum, calculate the wave-length of any line by making micrometric measurements of its position with respect to two or more neighboring lines whose wave-length is known. A formula due to Cauchy (Cauchy, *Mémoire sur la dispersion de la lumière*, Prague, 1836), has been heretofore used in making such calculations. It is a formula giving the connection between the index of refraction and the wave-length of light. The formula is

$$n = a + \frac{b + c}{\lambda^2 + \lambda^4}$$

In this formula, n is the index of refraction, λ is the wave-length of the light that has this index of refraction, and a , b , and c , are three constants. These three constants can be determined by measuring the index of refraction, n , in the case of three different wave-lengths, or lines which are known. Knowing a , b , and c , we can then calculate the wave-length corresponding to any other line by measuring its index of refraction, and solving the formula for λ . This involves solving an equation of the second degree. J. Hartmann proposes a formula which he claims is much simpler and also more accurate than Cauchy's. The formula is,

$$n = n_0 + \frac{c'}{(\lambda - \lambda_0)\alpha}$$

This formula has four constants, n_0 , c' , λ_0 and α , and therefore one would expect it to represent the facts more accurately than Cauchy's formula. For the ordinary crown and flint glass prisms in use, however, $\alpha = 1.2$, so that only three constants remain to be calculated. Hartmann tested the formula and found that it represented the facts much more accurately than Cauchy's formula. It also has the great advantage that it can be easily solved for λ thus,

$$\lambda = \lambda_0 + \frac{c}{(n - n_0)\alpha}$$

This form of the formula would serve for the calculation of the wave-length when the index of refraction had been measured, the constants having been previously determined. Hartmann calls attention to further conveniences in the use of the formula. (*Astroph. J.* 8. 218. 1898.)

Zeeman Effect.—The phenomenon known as the Zeeman effect is one of the most important discoveries in physics of the past few years, and considerable work has been done by observers during the year 1898 in investigating its exact nature. The discovery was made in 1896 by Dr. Zeeman, now at Amsterdam, although a number of experimenters beginning with Faraday in 1862 had made attempts to get some such effect, but had failed. The phenomenon is a peculiar change in the kind of light sent out by the particles of an incandescent gas when these particles, that is, the source of light, are placed in a magnetic field. When an electric spark is passed between two electrodes of cadmium, and the light from it is observed by means of a spectroscope, the cadmium spectrum is seen, consisting of a number of bright lines. If we confine our attention to one of these, a violet line representing light of wave-length 4,678 Angström units, (1 Angström unit = 10^{-10} meters) it appears ordinarily as a bright line, but if the spark is placed in a sufficiently strong

magnetic field, and is viewed by the spectroscope in a direction perpendicular to the lines of force, the single line becomes a triplet, with the central component in the place where the original unaltered line was. If it is viewed in a direction parallel to the lines of force it appears as a doublet. The position of the lines indicates the wave-length of the light, and this indicates the frequency of vibration of some part of the vibrating structure in the source of light. The tripling of the

lines indicate that the vibrations which formerly all took place with the same period are changed into three groups that vibrate with slightly different periods, one of which is the same as the original period, and the other two slightly different, one being greater and the other less. As shown by Lorentz and Zeeman, (*Phil. Mag.* 43. 226, 1897) and by Larmon, (*Phil. Mag.* 44. 503, 1897) this phenomenon can be explained if we assume that the light sent out, comes from little particles each having on it a charge of negative electricity, and each vibrating at random around some centre of attraction in which the force varies directly as the distance of the particle from the centre. This hypothesis also explains the additional fact that the light in these lines of the spectrum is polarized so that the vibrations of the light in the central line are parallel to the lines of magnetic force, while the two side lines are polarized at right angles to this. When the light is viewed in a direction parallel to the lines of force, the central line disappears entirely, and the two side lines are then circularly polarized, in opposite directions however. The explanation depends on the fact discovered by Rowland that a moving charge of electricity has the same magnetic effect as an equivalent current of electricity, and therefore, like a conductor carrying a current, the moving particle carrying the charge in the magnetic field must be acted on by a mechanical force. This new force, in addition to the force attracting the particle to its centre of motion acts in such a way as to produce precisely the effect observed. The normal case may be represented in the diagram, in which A represents the unchanged line, B represents the appearance of the line when it is viewed perpendicularly to the lines of force, and C represents the appearance when it is viewed parallel to the lines of force.

Diagram representing simplest kind of Zeeman effect.

During the past year many experimenters have worked at the subject and as a result it may be said that most of the lines do act in just the way described, but that there are a great many exceptional lines which act differently. No theory has yet been brought forward to explain the exceptions. Cornu showed that in a triplet the middle line was often doubled, that is, it was really a quadruplet. Michelson claims from experiments with his interferometer that each line of a triplet is itself a triplet. Bacquerel and Deslandres discovered one line in the iron spectrum that was not changed at all. They also found that under fields as strong as 35,000 C. G. S. units, the carbon bands did not show any change. In addition to these, T. Preston also discovered some lines that were separated into six lines.

The study of the Zeeman effect and the discovery of relations between the wave-length of the lines, and between the effects on lines of different series cannot fail to add much to our knowledge of the structure of the ultimate molecules of matter. It is unfortunate that the effect is so small with the usual means of research that it is difficult to make any satisfactory measurements of its amount. (Cornu, *Journ. de Ph.* 6, 673, 1897. Becquerel and Deslandres, *C. R.* 126, 997, 1898, and 127, 18, 1898. Becquerel, *Journ. de Ph.* 6, 681, 1897. Preston, *Phil. Mag.* 45, 325, 1898. Michelson, *Phil. Mag.* 45, 348, 1898. These are a few important papers on the subject, together with those mentioned before.)

ELECTRICITY AND MAGNETISM.

Electrical Measurements by Alternating Currents.—Professor Henry A. Rowland, of the Johns Hopkins University, Baltimore, Md., has recently published a great many different methods of measuring such electrical quantities as resistances, self and mutual inductances, and capacities, by means of alternating currents and an electro-dynamometer. An electro-dynamometer is a form of galvanometer in which there are two coils of insulated wire, one of them fixed and the other one suspended in the middle of the fixed one by a fine wire. When an electric current, either continuous or alternating, is sent through both coils of the dynamometer their mutual magnetic action tends to make the suspended coil twist a little on its support. The amount of this twist indicates the strength of the current. The instrument is intended particularly for use with alternating currents as these would not affect an ordinary galvanometer.

Making use of some of these methods, Rowland finds that the well-known phenomenon of electric absorption in a condenser has the same effect, when alternating

currents are used, as a resistance in series with the condenser. This resistance however is not a constant for a given condenser, but depends on the frequency of the alternations. The phenomenon was first satisfactorily explained by Maxwell, and Rowland bases his investigation on this explanation.

One of the new methods of measuring resistances can be used in measuring a resistance as high as 10,000,000 ohms with an accuracy of one part in 1,000. This is a method that would be of great value in measuring the resistance of electrolytes in cases where at present Wheatstone's bridge and the telephone are used. (*Phil. Mag.* 45. 66, 1898.)

The Electro-Chemical Equivalent of Silver, or the Value of the Ampere.—(Report of Committee on Standards of Measurements, of the American Association for the Advancement of Science, at Boston, 1898.) Professor George W. Patterson and Dr. Karl Guthe, at the University of Michigan, Ann Arbor, Michigan, have made a determination of the ampere, that is, a measurement of the quantity of silver deposited by a current of one ampere, flowing for one second, through a solution of silver nitrate. To measure the absolute value of the current, they used a specially constructed, large-sized dynamometer, in which the movable coil was suspended by a phosphor-bronze wire. (See Electrical Measurements above.) The torque or twisting moment of this wire was used to counterbalance and to measure the torque produced by the passage of a current through the coils of the dynamometer. The torque produced by the wire was measured by suspending from it a cylindrical brass weight whose moment of inertia could be calculated from its mass and its dimensions, and noting the period of vibration of the weight. The result of their experiments is 0.0011192 grams per ampere per second. This exceeds Lord Rayleigh's value of 0.001118 by about $\frac{1}{4}$ of one per cent. (*Phil. Trans.* 175. p. 439, 1884). This value of 0.0011192 will change the value of the electromotive force of the Clark cell from 1.4342 volts to 1.4372 volts at 15° C. Using these new values of the ampere and volt, the difference between the specific heat of water as obtained by E. H. Griffiths using an electrical method of heating the water, and by H. A. Rowland using a mechanical stirring to heat the water, entirely disappears, after both have also been reduced to the hydrogen scale of the International Bureau. (E. H. Griffiths, *Phil. Trans.* 184 A, p. 361, 1893. H. A. Rowland, *Proc. Am. Acad.* XV. p. 75, 1879. W. S. Day, *Phil. Mag.* 46, 1, 1898.)

Electro-magnetic waves.—Screening effect. E. Branly has made some experiments to see in what sort of inclosures bodies must be placed in order to be shielded from electro-magnetic waves. Electro-magnetic waves were first discovered theoretically by J. C. Maxwell, who gave the equations for their propagation. They were first found experimentally by H. Hertz in 1887. Electro-magnetic waves are produced whenever an electric current in a conductor surrounded by a dielectric, is changing in strength, but they are most conspicuous when a spark discharge takes place between two conductors giving rise to oscillations in the charges on these conductors. When a current is flowing steadily in a conductor, the space around it to an infinite distance is filled with a magnetic field. When this current is stopped or started, the change in the magnetic field thus produced extends outwards through the surrounding medium, air say, with the velocity of light. When the changes in the current are at all periodic, these changes in the magnetic field follow each other in such a way that they can be called electro-magnetic waves. It is generally supposed on a great deal of good evidence, that light waves are really electro-magnetic waves having a very short wave length. It is these electro-magnetic waves which were first predicted by Maxwell, and experimentally investigated by Hertz, that are used in the telegraphing without wires that is so much talked of at present. (See Wireless Telegraphy below.) Just as in the case of light waves, some substances are opaque and some transparent to these electric waves. In general the best conductors of electricity, that is, the metals, are the most opaque, on account of their good conductivity. To experiment on the screening effect of metals, Branly placed a delicate apparatus for detecting electric waves inside of certain boxes or cases, the outsides of which were entirely covered with thin sheets of metal. He finds that when great care has been taken to close up every crack or aperture however small leading from the outside to the inside of the box, electric waves will not pass from the outside to the inside of the box, within the limits of the sensitiveness of the detector employed. He finds however that a very small opening or crevice is sufficient to allow the waves to pass into the inside of the box and be detected. In one case he used tin foil as thin as 0.01 mm. to cover the box without getting any effect on the inside, when all openings were very carefully closed. In his published account, the author does not give any idea as to the wave length of the waves used in the experiment. These experiments also show, what the known properties of waves would enable us to predict, that with waves of several meters in length, such as are frequently used in experiments, we cannot expect to get any perfect screening from the effects of the waves with ordi-

nary flat metal screens of any size that would be convenient to handle. (C. R. 127. 43, 1898.)

Magnetic susceptibility of liquid oxygen.—J. A. Fleming and J. A. Dewar have measured the susceptibility of liquid oxygen by a more exact method than the one which they had previously used, and they find that the mean value of it, in fields whose strength is between 500 and 2,500 C. G. S. units, is 324×10^{-6} . The magnetic susceptibility is defined to be the ratio of the intensity of magnetization to the strength of the field inducing this magnetization. There is a small tendency for it to decrease in strong fields. From these and other preliminary experiments they suggest that it is possible that it may be found that any one substance under different conditions of temperature and volume, the magnetic susceptibility varies directly as the density and inversely as the observed absolute temperature, taking -273° C. as the absolute zero. (*Proc. Roy. Soc.* 63. 311, 1898.)

Roentgen rays.—The discovery of the so-called Roentgen or X-rays a few years ago by Professor Roentgen of Würzburg, is in some ways perhaps the most remarkable that has taken place in recent years. It is certainly one most fitted to arouse the imagination of the unscientific man, as well as of the trained physicist. As soon as Roentgen gave his discovery to the world, a great many investigators took up the work and repeated all of his observations, and in many cases added to our knowledge of the subject. The new facts concerning these radiations were increased with great rapidity at first, but during the past year the number of discoveries has so fallen off that the mine shows signs of exhaustion except at the hands of a few skilful experimenters. The most interesting work that has been done recently is with reference to the explanation of the phenomenon.

The main facts so far discovered in regard to these rays are briefly these. They are produced when an electric discharge or current is sent from one electrode to another in a vacuum or Crookes tube, as it is sometimes called. They have some connection with the so-called cathode rays, which at a high exhaustion stream out from the cathode perpendicular to its surface. The cathode is the name given to that electrode by which the current leaves the tube, the anode being where it comes in. These cathode rays ordinarily proceed in straight lines through the vacuum tube, and it is from the parts of the tube, or of the anode, or of any other obstruction which they strike, that the Roentgen rays proceed. These Roentgen rays have the following remarkable properties. They make certain chemical compounds, such as barium-platino-cyanide, on which they fall, fluoresce, or give out a pale phosphorescence. It was this property which led to their discovery. They affect a sensitive photographic plate in the same manner that ordinary light does. Their most remarkable property is that all substances, including metals, are to some extent transparent to them, but in different degrees. It is this property which gives them their great value in medicine and surgery. Flesh is much more transparent than bone. They move in straight lines, but unlike ordinary light, they have not yet been reflected, nor refracted, nor has anything corresponding to their diffraction ever been discovered. When they strike on a polished metallic surface, they do give a diffuse reflection like that from white paper in the case of ordinary light. They have never been polarized. They make some non-conductors or dielectrics through which they pass become conductors of electricity. In the case of gases this is without doubt due to the fact that some of the gaseous molecules are separated into ions or charged atoms. The human retina is slightly sensitive to these rays. The rays from the tubes having the highest vacua have the greatest penetrating power. Roentgen rays are not deflected by a magnet, while the cathode rays are.

A number of attempts or suggestions have been made as to the explanation of the Roentgen rays. One was that they are longitudinal waves in the ether, ordinary light being the transverse waves. This hypothesis however has not been in much favor. Another one was that they are streams of very fine particles emitted from the Crookes tube, so fine that they can pass through a dense substance like glass just as rain can pass through a thinly-leaved tree. The two theories which are most in favor at present may be called the short-wave theory and the hedge-firing theory. The short-wave theory supposes that the Roentgen rays are exactly like ordinary light waves, except that their wave-length is very much shorter. It asserts that such very short waves of light would in fact act in just the manner that Roentgen rays do, in not being reflected nor refracted. The hedge-firing theory is the latest one, and was originally proposed by Sir G. G. Stokes, (*Mem. Manch. Lit. & Phil. Soc.*, Vol. 41, 1897) and afterward worked out more completely by J. J. Thomson. (*Phil. Mag.* 45. 172, 1898.) Stokes supposes, with most physicists, that inside the Crookes tube, the cathode rays consist of a stream of small particles, each one negatively electrified, which are projected from the cathode. When each one of these particles strikes the anode, or any obstruction like the glass walls of the tube, a single wave or pulse is sent out in all directions through the sur-

rounding space. The Roentgen rays are simply a succession of such independent impulses caused by the shower of particles from the cathode striking on the anode. Each of these pulses will be exceedingly thin. According to Stokes, such an irregular succession of pulses, each being a wave very thin compared with a wave of light, would explain the absence of diffraction. It also explains the absence of refraction, if a new theory of refraction is assumed. According to this new theory, when a light disturbance first enters a prism, say, refraction does not occur immediately, but only after a number of vibrations of the same period have passed into it, and have had an opportunity of setting the particles of the prism into sympathetic vibration. In the case of these independent impulses supposed to constitute the Roentgen rays, the particles of the prism have no opportunity to get put into sympathetic vibration. J. J. Thomson has elaborated this theory of Stokes. He assumes on strong experimental evidence that the little cathode ray particles are particles charged with negative electricity, and that they move with tremendous velocity. When these charged particles are suddenly stopped, an electrical pulse, or single wave, spreads through the surrounding space. Thomson calculates the nature of this mathematically, from the known laws of electricity. This pulse is very thin, but very intense, and Thomson puts forth the view that this is one kind of Roentgen radiation.

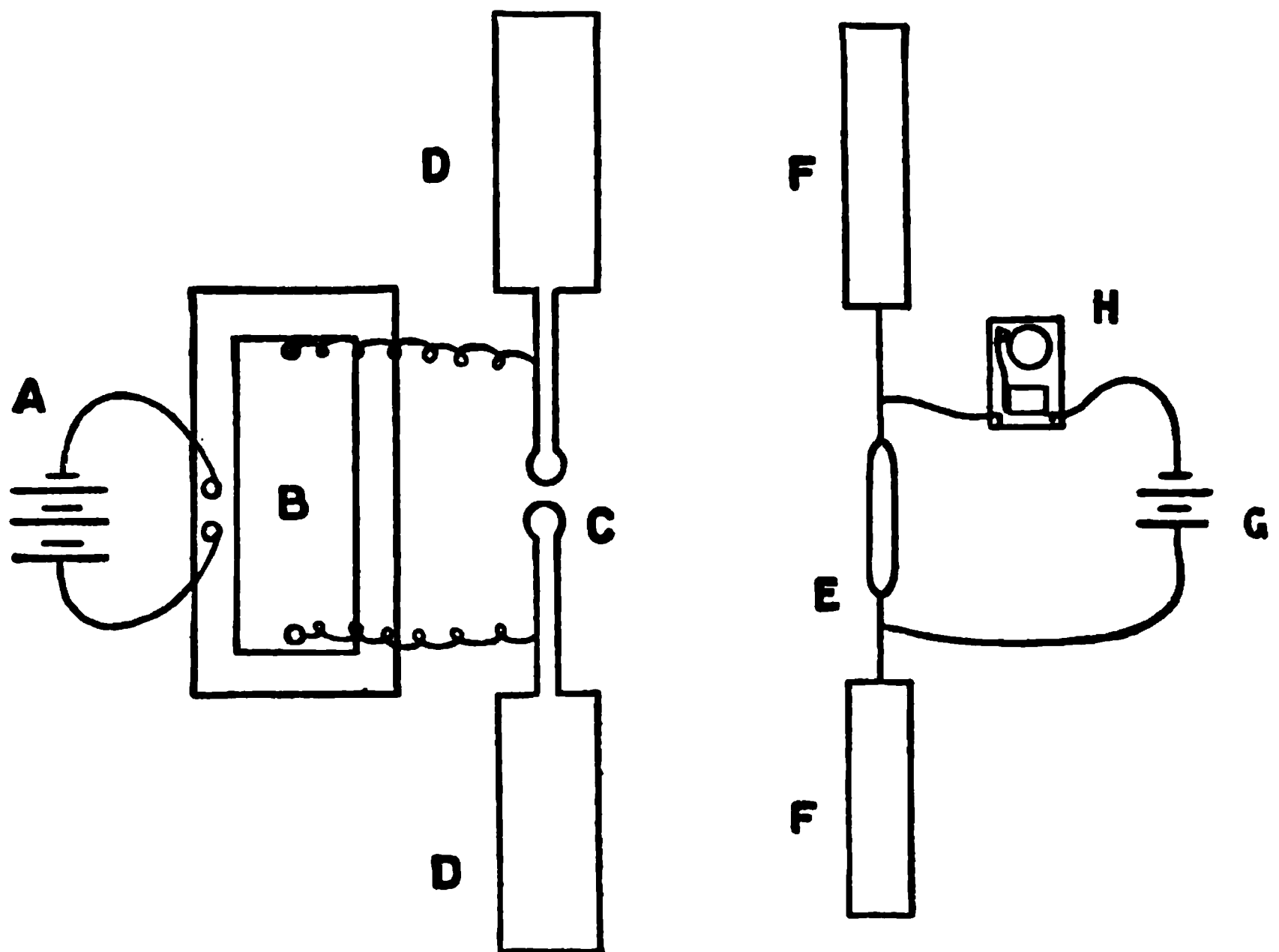
In apparent opposition to this theory of Stokes and Thomson, Lord Rayleigh holds, (*Nature*, 57, 606, 1898.) that such a succession of impulses is equivalent in every respect to ordinary light of excessively short wave length, too short to be visible, of course. This view is explained at considerable length by Dr. G. Johnstone Stoney. (*Phil. Mag.* 45, 532, and 46, 253, 1898.) Rayleigh's objection seems to be that any periodic disturbance, however irregular, is equivalent in all respects to a combination of simple harmonic disturbances, according to Fourier's theorem, and by taking the period large enough, we may, for practical purposes, say that *any* disturbance is equivalent to a combination of simple harmonic disturbances. An analogy will make this clearer. When the very complicated and irregular sound from a church organ or orchestra reaches our ears, our ear-drums go through a very complicated and irregular vibration, but the wonderful mechanism of the internal ear analyses this vibration, in a skilled musician at least, into a large number of simple components which may or may not have a real existence in the musical instruments, but which are identical in their combined effect to the sound actually heard. In the case of Roentgen rays, a single pulse, or a confused and irregular succession of them, would therefore be equivalent to the combined effect of a certain selection of trains of very short waves. It would seem however that there was no real dispute between the two parties. A succession of independent pulses or single thin waves as imagined by Stokes and Thomson, would in all probability behave as the Roentgen rays actually do behave. These pulses however, even in the most extreme case, *might* very likely be so far apart compared with their wave length, that any system of trains of waves that would be equivalent to them would be waves exceedingly short compared with the apparent wave-length of the pulses. Whichever way we regard it therefore if the pulses were far apart, the effect would be the same. The gross particles of matter through which these waves passed would not be able to acquire any sympathetic vibration, and therefore would have no effect whatever on the velocity of propagation, that is, there would be no refraction. It may be remarked that Stokes' theory explains the advantage there is in using a very dense metal such as osmium, or osmium-iridium, as an anti-kathode, following a suggestion of Sylvanus P. Thompson.

Standard high resistances.—Mr. F. B. Fawcett has devised a new form of standard high resistance which has the great advantage of being not only cheap but reliable. Heretofore very large resistances of say 100,000 to 1,000,000 ohms (one megohm) have been constructed of fine insulated wire which is reliable but very expensive, or of carbon in some form which is quite cheap, but unfortunately unreliable. Mr. Fawcett makes use of the thin films of metal which are deposited in vacuum tubes from metallic cathodes when electric discharges are for a long enough time sent through the tube. He uses gold and platinum wires for the cathode and thus gets a thin film of these durable metals deposited on a glass plate placed near the cathode for this purpose. The resistances can be adjusted to any desired value by scraping off the film in the proper way. (*Phil. Mag.* 46, 500, 1898.)

Wireless telegraphy.—The subject of wireless telegraphy has been much discussed and worked at during the past few years. There is not space here to give an adequate account of the whole subject, but only a general description of the scientific principles involved and the direction in which the latest advances have been made. A good recent account of the whole subject by S. P. Thompson, may be found in the *Journal of the Society of Arts*, Vol. 46, p. 453, 1898. In general three different methods have been made use of which may be classified as conduction methods, induction methods, and wave methods. In the conduction methods, the signaling

currents are sent through the earth from one electrode to another at the sending station. The currents spread out to a considerable extent through the earth in the neighborhood, and a very small portion is as it were picked up by two electrodes connected with a wire and galvanometer at the receiving station. In this manner, W. H. Preece in England has sent signals four miles. In the induction methods, use is made of the property which alternating currents possess of exciting similar currents in neighboring conductors. It is the principle of the alternating current transformer, except that in the case of the transformer, the desire is to get as intense a current as possible in the secondary circuit, and the two circuits are therefore placed as close together as possible. In telegraphing, however, the desire is to get *some* current in the secondary at as great a distance as possible. Mr. W. H. Preece has used this method, or a combination of it with the first kind, and has signaled forty miles with it. (See Proceedings of the International Electrical Congress, at Chicago, in 1893.)

The third method makes use of electro-magnetic waves. It has long been comparatively easy to make such waves, the chief difficulty having been in detecting them. The form of detector most commonly in use is a sort of relay circuit whose principal part is a so-called "coherer." The coherer is simply a glass tube filled with metallic filings into the ends of which the terminals of a relay circuit enter. Such a coherer has the property of not conducting electricity in its ordinary condition, but as soon as electrical waves fall on it, it becomes a good conductor and the relay circuit is closed, ringing a bell or giving any other convenient signal. As soon as the signal is given, the coherer is tapped by some convenient tapping device, and this jars the filings so that the coherer becomes practically a non-conductor as before. The sketch shown herewith gives a diagrammatical representation of the



Diagrammatical sketch of Transmitter and Receiver for Electric Waves.

TRANSMITTER.

- A.—Battery to supply primary circuit of induction coil.
 B.—Induction coil.
 C.—Spark gap.
 D.—Parts of vibrating system.

RECEIVER.

- E.—Coherer
 F.—Parts of vibrating system.
 G.—Battery of relay circuit.
 H.—Bell, Morse instrument or other current indicator.

principal parts of the transmitter and the receiver used in this kind of signaling. The electric waves are produced by sparks, which, by means of an induction coil, are made to pass through a dielectric between suitable metallic conductors. The resulting oscillations of the electric charge on the conductors causes electrical waves which spread out in all directions. When these waves fall on other conductors.

particularly on a system of them which is similar with respect to its possible electrical vibrations, they excite oscillations on these conductors, and the spark gap being replaced by a coherer, the relay circuit is closed, and a signal is made. One of the conductors forming part of the vibrating system is usually quite long, and is elevated in the air by means of a pole, a kite, or a balloon. Signor Marconi, who has made many experiments in England, uses for filings in his coherer, 96 per cent. of hard nickel, and 4 per cent. of silver. The air is exhausted from the tube containing the filings. Marconi has successfully signaled across the water from the Isle of Wight a distance of seventeen miles. As electric waves are supposed to differ from light waves only in the wave-length, the question might be asked, Why are they any better than flash-light signaling? The answer is because they will go through fog and mist and even a great many solid substances that are opaque to light.

The exact mechanism by which these coherers operate has long remained uncertain, although many hypotheses have been made. This subject has however probably been cleared up during the past year. (*Elect.* 42. 217, 1898.) Malagoli made a coherer by strewing metallic particles along a sensitive photographic plate, and between two sheets of tin-foil. Then he allowed electric waves to fall on this, and after developing and examining the plate, he found that where the particles had come into close contact a little spark had passed from one to the other. D. van Gulik (*Wied. Ann.* 66. 136, 1898.) examines all the different theories, and by a few critical experiments comes to the following view, which is really a verification of O. J. Lodge's hypothesis. Before the electric waves fall on the coherer, the little metallic filings which otherwise would be in mechanical contact, are separated by very thin layers of oxide. When the electric waves fall on them, minute sparks pass from one to the other tearing holes in this layer, and also tearing off some particles of metal, enough to make a sort of temporary bridge between one filing and the next, along which the current from the battery then flows. The slightest jar of course destroys this bridge, and the resistance of the coherer returns to its former high value.

ASTROPHYSICS.

Planetary Atmospheres.—Dr. G. Johnstone Stoney has applied the kinetic theory of gases to the investigation of the atmospheres of the planets. It will be well first to recall some of the principal points of this theory. (See Maxwell, *Theory of Heat*, p. 307.) According to it, a gas is supposed to consist of a great number of molecules or particles moving with great velocity. During the greater part of their course, these molecules are not acted on by any sensible force, and therefore move in straight lines with uniform velocity until they come into collision with other molecules. When two molecules collide, a mutual action takes place between them which may be compared to the collision of two billiard balls. The course of a molecule between one collision and the next, is called the free path of the molecule. Ordinarily the free path of a molecule takes much more time than that occupied in collisions. The average velocity of the molecules is so great, and there is such an enormous number of them in a cubic centimeter under ordinary conditions of pressure and temperature, that each molecule suffers an enormous number of collisions in one second, and the direction of its motion is changed with each collision. What is called the temperature of a gas depends on the average kinetic energy of its molecules, so that when two gases have the same temperature, the individual molecules of one gas have each on the average the same kinetic energy as the molecules of the other. The average length of the free path, or the mean free path, depends on the density, for different conditions of the same gas. In any gas at a given temperature, there is a certain velocity of the molecules which can be called the average velocity, and which as many molecules exceed as fall short of. Most of the molecules have velocities near this average velocity. When we consider velocities differing from this average velocity, we find that the further we go from the average velocity, the fewer are the molecules which have velocities of this amount, and there is finally a limit in the direction of high velocities such that, with a given gas at a given temperature, there is a maximum velocity which practically no molecule of the gas ever by any accident reaches. If we have a number of different gases at the same temperature, the average velocity of the molecules must be greatest in that gas having the smallest molecular weight, in order to have the kinetic energy the same. In fact, the squares of the average velocities must be to each other inversely as the molecular weights. This brief summary will help to make clear some of the statements which follow.

Dr. Stoney's investigation takes account of the conditions prevailing on the different planets which will determine whether any given gas will be retained in the atmosphere of a planet, in case it exists there, or will drift away. The most important of these conditions are the force of gravity at the outer parts of the planet's atmosphere,

and the temperature prevailing there. By a consideration of these conditions, Dr. Stoney shows why hydrogen and helium do not exist in the earth's atmosphere, and why the moon can have no atmosphere consisting of any known gases. He also concludes that water cannot exist on either Mercury or Mars. The snow-caps on Mars are probably made of carbon dioxide. On the other hand, all known gases may be constituents of Jupiter's atmosphere. The molecule which drift away from the planets probably do not leave the solar system, but are circulating around the sun in independent orbits like minute planets. (*Trans. Roy. Dub. Soc.* 6. 305, and *Astroph. J.* 7. 25, 1898. *Sci. Abstr.* 1. 533, 1898.)

Solar Eclipse.—There was a total solar eclipse on January 22, 1898, which was visible in central India, and was observed by a number of parties. The weather was fine. A good many photographs of all aspects of the phenomenon were taken, including a number of successful ones of what is called the chromosphere flash. The chromosphere is the outer layer of the sun's atmosphere and contains those substances in the form of gases which absorb some of the light coming from below them, and in this manner cause the Fraunhofer lines in the solar spectrum. If this layer of the sun could be observed spectroscopically by its own light, the Fraunhofer lines instead of being dark absorption lines would of course be bright emission lines. During an eclipse, when the sun's disc is almost completely covered by the moon's disc and only a small part of the chromosphere is visible, it has recently been found possible to photograph the spectrum of the chromosphere by its own light and obtain what is called the chromosphere flash, or a spectrum showing most of the Fraunhofer lines as bright lines. But the chromosphere spectrum is not merely a reversal of the Fraunhofer lines, as it contains some others that do not appear among them, and some of the Fraunhofer lines, are absent. It was noticed that the metallic lines were stronger near to the sun's limb, and weaker at greater altitudes.

In this eclipse the corona was observed and photographed, as was also its spectrum. A close correspondence was observed between the coronal streamers and the prominences visible. The form of the corona bore a considerable resemblance to its form in the eclipses of 1886 and 1896. One observer obtained photographs which show a polarization of the light from one streamer of the corona. This suggests that some at least of the light from the corona is reflected light.

It is too soon to know yet all that has been learned from this eclipse as the complete study of all the photographic plates has not yet been finished. (*Proc. Roy. Soc.* 64, 1, 1898. *Astroph. J.* 7. 304, 1898.)

ABBREVIATIONS USED IN REFERENCES.

- Am. J. Sci. American Journal of Science.
- Astroph. J. Astrophysical Journal.
- Chem. News. Chemical News.
- C. R. Comptes Rendus of the Paris Academy of Sciences.
- Elect. The Electrician. (London.)
- Journ. de Ph. Journal de Physique.
- Mem. Manch. Lit. and Phil. Soc. Memoirs of the Manchester Literary and Philosophical Society.
- Phil. Mag. London, Dublin and Edinburgh Philosophical Magazine.
- Phil. Trans. Philosophical Transactions of the Royal Society of London.
- Proc. Am. Acad. Proceedings of the American Academy of Arts and Sciences. (Boston.)
- Proc. Roy. Soc. Proceedings of the Royal Society of London.
- Proc. Roy. Soc. Edinburgh. Proceedings of the Royal Society of Edinburgh.
- Sci. Abs. Science Abstracts.
- Trans. Roy. Dub. Soc. Transactions of the Royal Society of Dublin.
- Wied. Ann. Annalen der Physik und Chemie.

In each reference, the numbers following the name of the journal indicate usually in succession the volume, the page, and the year.

PHYSIOLOGICAL SOCIETY, AMERICAN, organized in December 1887. Last annual meeting was in New York City December 27-29, 1898. President, R. H. Chittenden, Ph. D., New Haven, Conn.; Secretary, F. S. Lee, M. D., College of Physicians and Surgeons, New York City.

PHYTOGEOGRAPHY. See BOTANY (paragraph Ecology and Plant Geography).

PICARD, LEMERCIER, was a detective employed in the Dreyfus affair, concerning which he secured much valuable information. In the spring of 1898 his body was found hanging in his lodging, and it was suspected that he was the victim of foul play on account of his knowledge of secrets damaging to officials in the War Department. See FRANCE (paragraphs on History).

PICQUART, LIEUTENANT-COLONEL G., one of the strongest defenders of Dreyfus (see FRANCE), was in 1896 the chief of the Bureau of Secret Intelligence, and down to the spring of that year had no doubt of the guilt of Dreyfus. But at that time, happening on a visiting card of Major Esterhazy's, was astonished by the apparent identity of the handwriting on its back with the handwriting of the *bordereau*. He at once began an investigation, and having found that the card had probably been left by Esterhazy at the German embassy in Paris, his suspicions were further aroused, and he soon became convinced that Esterhazy was the guilty person. He was an important witness in the first Zola trial, giving his testimony with a completeness and disregard of consequences that surprised all. He said that after his activity in tracing the real author of the *bordereau*, he fell into disfavor with the authorities. He was sent to Tunis and all his letters, which reached him there, were opened. He found that the authorities were apparently unwilling to listen to anything which would upset the verdict against Dreyfus. It seemed as if they were bound to shield Esterhazy from the consequences of his act. He was the object of constant insult and abuse from the press, was obliged to fight a duel with Colonel Henry, in which the latter was wounded, and was threatened with all sorts of terrors by Major Esterhazy, who, however, did not make good his threats. As soon as M. Cavaignac had made his speech of July 7, 1898, in which he referred to three documents as conclusive proof of the guilt of Dreyfus, Colonel Picquart wrote that he was ready to prove that the first two documents had nothing whatever to do with the case, and that the third, dated 1896, bore all the marks of a forgery. Colonel Picquart was brought to trial before the Correctional Tribunal on the charge of divulging secret documents. His prosecution was afterwards transferred to the military authorities. He was accused of forgery and using forged documents, and was thrown into the military prison of Cherche-Midi. In his arraignment he made a great sensation by hinting that an attempt might be made on his life by the authorities.

PIG IRON. See IRON AND STEEL.

PILGRIM FATHERS, UNITED ORDER OF, a fraternal society founded in 1879, has one supreme colony, 216 subordinate colonies and 23,879 members. Since its organization it has disbursed \$2,978,530 and \$375,000 during its last fiscal year. Supreme Governor, T. S. Taft, Keene, N. H.; Supreme Secretary, James E. Shepard, Lawrence, Mass.

PILLAGER OUTBREAK. The discontent among the Chippewa Indians in northern Minnesota during 1898 culminated in October in an outbreak of the Pillager band living on Bear Island in Leech Lake, Cass county, and an attack by them on United States troops. The discontent, caused by years of unjust treatment, had been brewing for a long time, and was augmented by the proposal to remove the Indians from White Earth Reservation and further by the reduction of their annuities. The immediate cause of the Pillager trouble arose from the arrest of an Indian to appear as a witness in a whiskey case. Refusing to go on the ground that in previous cases Indians had not been paid their witness fees, he was rescued by his comrades from a United States marshal. About eighty regulars under Brigadier-General Bacon, proceeded to Leech Lake for the purpose of dealing with the Indians. On October 5 this party had advanced without seeing any Indians to a point on the shore opposite Bear Island, and were preparing dinner, their arms being stacked, when a soldier accidentally discharged a gun, which was the signal for an attack from ambush by the Indians under the leadership of Red Blanket. There was sharp fighting for three quarters of an hour and the firing did not entirely cease until dark. In the government party an officer, five privates, and an Indian policeman were killed and eleven men wounded. No Indians were killed. It is probable that no more than forty Indians took part in the attack. It was feared that the excitement would extend to the other Chippewa bands, but the arrival of several regiments discouraged further disturbance.

Authorities testify to the long suffering of the Chippewas and to the fact that they have never made an attack on the whites since the close of the war of 1812. It will be remembered to their credit that they refused to take part in the Sioux massacres of 1862. In the outbreak in October, moreover, no hand was raised against women, children, or unarmed men. Their dissatisfaction is of long standing. Besides the proposal to remove them from White Earth reservation, the refusal by the Governor to allow their claim for \$35,000 for the improvement they had made on their land, increased their discontent. The character of many of the men in charge of agency affairs has also had a bad influence on the Indians. The troubles may be said to date back to 1889, when a commission, consisting of the Rt. Rev. Martin Marty, ex-Senator Henry M. Rice, and Mr. Joseph B. Whitney, negotiated a treaty with the Chippewas (which, it may be said, the Pillager band did not ratify) by which the latter ceded, as a tribe, "all their land in Minnesota, except the Red Lake and White Earth reservations, and also so much of these reserves as should

not be needed for allotment." In return, among other things, each man, woman, and child was to hold 160 acres of land in severalty. It was arranged that the wonderful pine forests, the only very valuable possessions of the Indians, should be estimated and in part sold by the government, the proceeds, above the cost of estimation, cutting and transportation, and that of the various commissions, etc., to go to the Indians. They were promised an annuity of at least \$9 per capita for a term of fifty years, and were assured that the increasing returns from their pine would in time advance the annuity to two or three times the above amount. This treaty, however, was broken on the part of the government, but still the Indians were not allowed to abrogate it, and the destruction of their forests continued.

This question of the pine overshadowed all other grievances of the Indians against the officials. In President Harrison's administration a commission for estimation was appointed, which did the work so incompetently and dishonestly that in the following administration it was necessary that a reappointment be made and the work done over. Unfortunately the second commission was little or no better than the first. The Hon. Melvin R. Baldwin, Chairman of the Chippewa Commission, said that the cost of these two estimates was \$350,000, while the real value of the work done was about \$6,000. Still unsatisfactory, the work of estimation was begun again by a new commission in the present administration. On the basis of the old estimates, many of which were far below the actual value, contractors bought large quantities of pine and thereby made immense profits. It will be seen that the expense occasioned by this incompetency and fraud was borne by the Indians.

Another source of complaint arose from the ill management which permitted green pine to be cut along with "dead and down" pine and sold at the price paid for the latter timber, 75 cents per thousand feet of logs being paid for the "dead and down" and \$4.75 to \$5.00 per thousand for the green. This dishonesty became so prevalent that the practice of firing the forests was introduced, thereby a sufficient amount of the dead timber being secured to insure the cutting of large quantities of green logs to be bought of course at the dead timber price. Amid all this pillage at the expense of the Indians, they were suffering from actual want and poverty; and as a last blow, came the reduction of their annuity from \$9.20, to \$5.50, which, though apparently a small matter, was not considered such by the Indians.

As a general outbreak had never been contemplated, there was no fighting after the first skirmish. A friendly arrangement was soon brought about, and the determined stand made by the Indians has had the effect to call public attention to the matter in such a way that there is now a fair prospect for an adjustment of their grievances.

PILLSBURY, PARKER, a noted abolitionist and reformer, died at Concord, N. H., August 7, 1898. He was born at Hamilton, Mass., September 22, 1809 but his parents removed to New Hampshire when he was a child. He studied theology at Gilmanton and Andover Seminaries and was licensed to preach in 1839, but at the time of the abolitionist agitation, under the leadership of Garrison, he gave up the pulpit and devoted himself to the new movement on behalf of which he delivered many speeches, and in 1854 visited England in order to enlist public sympathy there. He was a supporter of the American Anti-Slavery Society and an advocate of its continuance. He was also an advocate of woman's suffrage and other social and moral movements for reform. An exceedingly earnest and forcible speaker, he exerted extraordinary influence upon his audiences; but his vehemence often betrayed him into exaggerated language. He was especially bitter in his denunciation of the attitude taken by the church toward American slavery and on one occasion he was summoned before the Suffolk Association with a view to revoking his license. He thereupon severed his connection with the church and at the same time administered a sharp rebuke to his former brethren. He was associated with Garrison, Rogers, Phillips and other prominent promoters of the movement, few of whom equalled him in the power of invective.

PINERO, ARTHUR WING, dramatist, born in London, May 24, 1855. He was educated in private schools, and from 1874 to 1881 was on the stage, acting at the Haymarket and Lyceum Theatres. His first play, *Two Can Play at That Game*, was played at the Lyceum, and was followed by *£200 a Year* (1877); *The Money Spinner* (1880); *The Squire* (1881); *Lords and Commons*; *The Rocket* (1883); *The Magistrate* (1885); *Sweet Lavender* and *The Second Mrs. Tanqueray* (1893); *The Notorious Mrs. Ebbsmith* and *The Benefit of the Doubt* (1895); *The Princess and the Butterfly* (1897); and others. In 1898 he wrote *The Beauty Stone*, set to music by Sir Arthur Sullivan and Comyns Carr, and the very successful play *Trelawny of the Wells*.

PIPE. See PIPE LINES, SEWERAGE, and WATER-WORKS.

PIPE LINES. Steel and wood stave pipes have been coming into extensive use of late for conveying water for public supplies, irrigation and power purposes. Either

has the great advantage, over cast iron, of lightness. The wooden stave pipe is especially available for use in rough country, remote from railways, because being built up from single staves in the field the latter may be transported in as small loads as is necessary. The separate staves are milled to shape before shipping and are held together by iron or steel bands. These also withstand the outward pressure of the water, being placed near together or far apart, according to the pressure. Such pipes may be built in almost any size and are now very common in the west. Steel pipes are made from plates $\frac{1}{8}$ inch thick and upwards, according to pressure, generally riveted longitudinally and horizontally. The pipes are coated with asphalt or some sort of Japan. Steel pipe lines from 2 to 20 miles in length have been built in connection with a number of water-supplies, some of the diameters being: 60-in., Allegheny, Pa.; 50-in., Minneapolis, Minn.; 48-in., Newark, N. J., and New Bedford, Mass.; 42-in., Duluth, Minn.; 40-in., Cambridge, Mass.; 38 and 36-in., Rochester, N. Y. Near the close of 1898 a contract was let in Western Australia for a single steel pipe line 30 inches in diameter and 328 miles long. The pipe will be formed and the longitudinal joints secured by bending two plates to semi-circular shape and inserting their edges in steel bars provided with grooves, then subjecting the bars and inserted plates to heavy pressure. The circumferential joints will be made by using sleeves. Nearly all the pipe will be made from plates $\frac{1}{4}$ inch thick, a small portion being from $\frac{1}{8}$ -in. plates. The contract price for the pipe line was \$4,990,000. Besides this, there will be a number of pumping stations, as the line is designed to convey water from near the coast to gold fields in the interior, 1,313 feet above the source. The line is designed for a capacity of about 5,000,000 gallons a day. It was designed by Mr. C. Y. O'Connor, of Perth, W. A., engineer-in-chief of the Department of Public Works of Western Australia. The work is being done by the department named.

PIRENE. See ARCHÆOLOGY (paragraph Greece).

PLAGUE. Canton, Hong-kong, Amoy and Bombay continued to furnish many cases of the bubonic plague during the past year. Sticker, of Munich, reports many cases of *pestis minor* which recovered, but were attacked by the characteristic sequelæ, paralysis, atrophy and acute tuberculosis. Haffkine, in the *Indian Med. Gazette* for January, 1898, reports upon a very virulent epidemic of the disease in Lower Damaun, where a mortality of 2,325 occurred in a population of 11,000. His treatment by inoculation with the plague serum was efficient; for of over 6,000 persons not inoculated 24.6 per cent. died of the disease, while of over 2,000 inoculated but 1.6 per cent. acquired the disease. Diedonné of Munich had reported, a year ago, that the mortality after the first use of the serum treatment was 7.6 per cent. rising to 49 per cent. during the second period of its use; but the mortality during this epidemic in cases not treated with the serum was over 80 per cent.

The bacillus of bubonic plague was discovered independently by Kitasato and Yersin, in 1894. It is a small oval rod, short and thick, with rounded ends that take stain more readily than the central portion, giving the "pole staining." The bacilli are found singly or in pairs and, in cultures, arranged in chains. They do not form spores, and are non-motile. They occur in enormous numbers in the swollen glands (buboes), in the spleen, and in the blood. The lower animals, especially rats, are infected in large numbers from the dust in pest-laden houses. Yersin found the organism in large numbers in the bodies of dead flies in infected localities. The highly unsanitary conditions under which the affected individuals live give ample opportunity for the direct or indirect transmission of the disease from patient to patient. Kitasato considers that the bacillus may enter the body by the skin surface through cracks or wounds, by the respiratory passages or by the alimentary canal. Wilm found the bacilli in the sputum and in the fæces of patients.

In order to control the epidemic, insistence must be made upon the most stringent hygienic measures, the disinfection of all excreta and the destruction of rats, mice and other lower animals. Inoculation with antitoxic serum produces immunity which lasts for a few weeks. Serum treatment of those who acquire the disease should be made compulsory. See INDIA (paragraphs on History), and SERUM THERAPY.

PLAISTED, HARRIS M., ex-Governor of Maine, died in Bangor, January 31, 1898. He was born at Jefferson, New Hampshire, November 2, 1828; was graduated at Colby University; studied law in Albany, New York, and was admitted to the bar in 1856. He was in the Union army in the Civil War and was advanced to the rank of Major-General by brevet. He was a member of the Maine legislature, 1867-68; was Attorney-General of the State, 1873-75; Representative in the Forty-Fourth Congress; having headed the fusion movement in Maine, he was elected Governor, serving in 1881-83. From the latter date to the time of his death he was editor of the *Augusta New Age*.

PLANETOIDS. See ASTRONOMICAL PROGRESS.

PLANT. See BOTANY.

PLANT GEOGRAPHY. See BOTANY (paragraph Ecology and Plant Geography).

PLANT PATHOLOGY. See BOTANY.

PLATINUM. The United States production in 1897 amounted to about 150 ounces, worth in the crude state, \$900, and came chiefly from Trinity and Shasta counties, California. Investigations which have been carried on during 1898 tend to show that the platinum occurs in more or less direct association with placer sands derived from serpentine rocks, and especially those rich in chromite. In Russia platinum is produced only in the Urals, and the 1896 production was 173,838 ounces. Most of the metal is exported for refinement, although two refining works exist at St Petersburg.

PLAYFAIR, Baron LYON, K. C. B. English chemist and statesman, died in London, May 29, 1898. He was born at Meerut, Bengal, India, May 21, 1819, was educated at St. Andrews, when very young became interested in chemistry, subsequently studied under Liebig, and in 1843 was appointed professor of chemistry at the Manchester Royal Institution. He was made a Companion of the Bath, became president of the Chemical Society of London in 1857, and in the following year was appointed to the chair of chemistry in the University of Edinburgh. Dr. Playfair entered Parliament in 1868 as a Liberal from the Scotch universities and became prominent in politics. He became Postmaster-General (1863) and a Privy Councillor; was raised to the peerage as first Baron Playfair of St. Andrews, and made a Lord-in-Waiting (1892). He was the author of many treatises on scientific and educational topics.

PLAYGROUNDS. See PARKS.

PLEISTOCENE. See TERTIARY.

PLIMSOLL, SAMUEL, who was known as the "Sailor's Friend," died at Folkestone, England, June 3, 1898. He was born in Bristol, England, in 1824; after a successful business career, he entered the House of Commons from Derby in December, 1868; he had previously contested this constituency without success, but thereafter was returned until 1880. He was devoted to furthering legislation for securing the seaworthiness of merchant ships, and originated the famous "Plimsoll Mark" to prevent the over-loading of ships; the legally fixed load line on all British vessels must be marked conspicuously. This prevents much loss of life and property.

PLIOCENE. See TERTIARY.

PLUTONIC ROCKS. See GEOLOGY (paragraph Petrography).

PNEUMATIC or TUBULAR DESPATCH. *Early Experiments.*—Pneumatic transmission dates back to 1667 in which year Denis Papin presented a paper before the Royal Society of London entitled *Double Pneumatic Pumps*. In this device air was exhausted from a long metal tube by two large pump cylinders. In the tube was a piston attached to a carriage by means of a cord, so that the carriage would move along as the piston was forced ahead by atmospheric pressure. In 1792 M. Van Esten, a native of France, constructed a machine by means of which a hollow ball containing a small package was propelled by a blast of air through a tube several hundred feet in length and containing many curves. In 1810 a London engineer named Medhurst published a pamphlet in which he proposed propelling small carriages on rails in air tight tubes or tunnels, by compressing air behind and exhausting it from the front of the carriage. In 1832 he suggested connecting the carriage in the tube with a passenger car running on top of the tube. This was tried but failed. Others offered suggestions of more or less value, among them MM. Jarroux and Taisseau, and MM. Brochet and Ardor. It was not until 1853-54 that any practical results were obtained. During this period Mr. Josiah Latimer Clark, acting as engineer for the Electric & International Telegraph Co., installed in London a 1½ inch tube about 220 yards long from the central station, Founders' Court, Lothbury, to the Stock Exchange, Throgmorton street. This was operated by connecting it with a vacuum chamber at the central station, carriers being sent only in one direction. A steam pump furnished the vacuum. In 1858 further improvements were made by C. F. Varley in connection with an extension from Telegraph st. to Mincing Lane. This consisted of 1,340 yards of tube 2¼ inches in diameter. To permit sending messages in both directions, a pipe ½ inch in diameter was laid parallel to the larger pipe. This was supposed to carry the vacuum to the latter station, but proved too small. A vacuum chamber 14x12 ft. by 10 ft. high was then constructed of timber and covered with sheet lead. It was not strong enough to withstand the pressure of the atmosphere upon the outside and collapsed. About the same time Mr. Varley became chief engineer of the Electric Telegraph Co., and began the use of compressed air, blowing the carriers through the tubes. In a series of very successful experiments messages were sent through a tube 2¼ inches in diameter and

1,340 yards long in from 50 to 55 seconds. These early $1\frac{1}{2}$ tubes were iron pipes screwed together; the $2\frac{1}{4}$ inch tubes were lead with plumbers' joints. The carriers were gutta percha cylinders covered with felt. It is an interesting fact that as early as 1855 Sir Rowland Hill proposed handling mail in London through nine 13 inch tubes. The proposition was investigated but dropped because the saving in time over the mail carts then in use did not seem to warrant the expense of installation.

Great Britain.—In 1863 The Pneumatic Despatch Co., of London, constructed a pneumatic tunnel railway. This extended from Euston Station to the District Post-Office in Eversholt St., a distance of about 1,800 ft. The tunnel was in section like the letter D turned on its edge, $2\frac{2}{3}$ ft. each way. The carriers were cradle-like boxes closely fitting the tunnel and moved about 12 miles per hour. In 1872 two similar but larger tunnels were built from Euston Station to the general Post-Office, a distance of $2\frac{3}{4}$ miles. These tunnels were $4\frac{1}{2}$ ft. wide by 4 ft. high, built of cast iron on the straight bottom and sides, and the arch of brick. Air for operating was obtained from a fan 22 ft. in diameter which drew air from one tunnel and forced it into the other, giving 10 ins. of vacuum or 6 oz. of pressure per square in. 12 minutes per trip were required, and there was one grade with a slope of 1 to 14. The carriages were $10\frac{1}{3}$ ft. long and weighed 2,200 lbs. The maximum capacity of this system was a ton per minute.

Berlin.—In 1863 Siemens & Halske, of Berlin, Germany, undertook to establish a system of pneumatic telegraph tubes for the city of Berlin. The work was completed in 1865 and consisted of two parallel wrought iron tubes $2\frac{1}{2}$ in. in diameter. These extended from the telegraph station to the exchange; a total length of 5,670 ft. of tube being employed. This was continuous, the air circulating under a pressure equal to nine inches of mercury, produced by a double acting steam air pump at the telegraph station. As in the former case this was soon extended until at present there are about 38 stations and over 28 miles of tubes. These were first arranged in continuous circuits with intermediate stations so that the carriers travel only in one direction. Experience proved that this was not the best method of operation and gradually the radical system was adopted until at present nearly all the stations are grouped about the central pumping stations to which they are connected by radiating tubes 2.559 in. in diameter.

The next step was taken in Berlin, Germany, where about 1868, Siemens Brothers of the city developed a system employing a go and return tube. They developed a method of stopping and starting carriers from intermediate stations and other special apparatus. In 1869 the British government gave them an order to install a 3 in. experimental line between the central telegraph station and the general Post-Office, London. This was built of flanged iron pipe bolted together and was finished in 1870 and proved so successful that it was extended to Fleet street and finally to Charing Cross. In 1870 J. W. Wilmot introduced a form of valve permitting carriers to be despatched continuously without interrupting the flow of air in the tubes, and in 1880 he perfected a signalling device, which indicated when the carrier passed out of a section. This permitted the operator to despatch a second carrier before the first carrier reached its destination. In London other lines were installed from time to time until there are now about 42 stations and 34 miles of tubes. These are $2\frac{1}{8}$ ins. in diameter for the short lines and 3 ins. for the long lines. They are of cast iron, lead lined in 29 ft. sections. The joints are soldered over a mantrel, the outside pipe being joined in the usual ball and socket manner. Similar systems have been installed in connection with the telegraph service in Liverpool, Manchester, Birmingham, Glasgow, Dublin and New Castle.

Paris.—In Paris practical operations date from 1865-66 when an experimental line was established from Place de la Bourse to the Grand Hotel, on the Boulevard des Capuciens; compressed air for operating was obtained by displacement with water drawn from the city mains. In 1867 the system was extended. In 1868 it was again extended and changed from the radial to the circuit system. Other extensions were made until 1875 when 17 stations were in use and 21 contemplated. The Paris tubes are of wrought iron in lengths of from 15 to 20 ft., the joints being made with flanges and bolts; the diameter is 2.55 inches; bends have a radius of from 6 to 150 ft. The carriers are despatched in trains of from 6 to 10 with a closely fitting piston carrier at the rear. These carriers are marked so that those intended for intermediate stations can be removed at the proper place. The dispatch speed is from 15 to 23 miles per hour. Similar systems have been installed in Vienna, and Brussels.

The United States.—In America experiments date back to 1867 at which time Mr. Alfred E. Beach constructed a circular wooden tube, 107 ft. long and 6 ft. in diameter, in which was run a car seating 10 persons, this was exhibited at the American Institute Fair. The motive force was obtained from a 10 ft. fan making 200 revolutions per minute. Later he constructed an 8 ft. tunnel for 200 ft. under Broadway, New York, which was operated by a large rotary blower; the car being sent back and forth by changing the direction of the air pressure.

In many of the large department stores in this country small pneumatic tubes have been used for many years. These are usually brass tubes, extended in from the various sections of the store to a central point, and the small metal carriers are either blown or sucked through these tubes. The first practical underground system was installed in 1876 by the Western Union Telegraph Co., in New York City. This company laid four lines on Broadway, connecting the main office down town with its sub-offices. Since that time a double line has been extended up Broadway to several other branch offices. In 1892 a company was organized under the laws of the State of New Jersey to construct, lay and operate pneumatic tubes for the transmission of United States mail, packages, merchandise, messages, etc., within the States of New Jersey and Pennsylvania. This company was styled the Pneumatic Transit Co., and it obtained control of patents granted to Henry Clay and Charles A. Lieb and constructed some 6,000 ft. of 6 in. pipe line in Philadelphia, after considerable trouble. On Feb. 17, 1893, this was officially opened and has since been in continuous operation. The line is arranged in two tubes, the distance between the two stations being 2,974 ft. The tube is made of cast iron pipe in 11 ft. sections, bored to $6\frac{1}{8}$ ins. and joined with the use of lead calked ball and socket joint. In installing, a trench was dug to the proper depth and the bottom well rammed to afford a secure foundation for the tubes. Turns were made with brass tubes, the radius being about 12 times the diameter of the tube. Air for operating is supplied from a duplex air compressor in the basement of the main Post-Office, which has 24 in. stroke, a 10 in. steam and 18 in. air cylinder. An air pressure of from 6 to 7 lbs is used in this plant.

Since this Philadelphia system was installed the Batcheller Pneumatic Tube Co. was incorporated to construct and operate pneumatic tubes outside of the State of Pennsylvania by this company or its sub-company. The Tubular Dispatch Co. of New York, constructed in 1897 an 8 inch line from the main Post-Office, New York City, to the Produce Exchange, a distance of 3,750 feet. The same company later installed a double line from the Post-Office to the Grand Central Palace branch office a distance of $3\frac{1}{4}$ miles, and also a line across the Brooklyn Bridge to the Brooklyn office, a distance of $1\frac{1}{2}$ miles.

The principle of operation and the apparatus employed is practically the same in all of these places so that one description will suffice. Two tubes are of cast iron $8\frac{1}{8}$ ins. inside diameter and 12 ft. long. They are laid between the desired stations, forming a circuit in which the air is kept continually circulating. Starting with the compressor which draws the air at atmospheric pressure, the air is compressed to a pressure depending entirely upon the length of the circuit, into a pressure tank whose function is to prevent any pulsations of the air in the tubes. The air then flows from this tank into the tube, out to the far station and back to a receiving tank which is open to the atmosphere. All sending, receiving and switching apparatus is designed so as not to interrupt this current of air. The transmitting device consists of two sections of pipe a trifle longer than the carrier, mounted upon a cradle device so that either section can be swung into line with the main tube, to form a part of the tube. The carrier is slipped into one of those sections which is open to the air, the other being in line with the tube, a lever is moved and air admitted to a pneumatic cylinder which swings the cradle over until the tube containing the carrier is in line with the main tube. Instantly the air pressure at the rear of the carrier forces it out of the cradle and carries it through the tube at practically the velocity with which the air current is moving. At the end of a given interval, regulated by a time lock on the transmitter, the cradle returns to its former position ready for another carrier. This time lock device prevents sending carriers too close together. At the receiving end, assuming only a two station line, there is a vertical gate closing the end of the receiving tube. Where a carrier approaches it compresses the air ahead of it in a short section just in front of this gate, sufficiently to reduce the carriers' velocity. At the same time the compressed air operates a valve which admits air from the main tube to the underside of a piston which is attached to the gate, just mentioned. This in turn opens the gate and allows the carrier to come out into the receiving tray where it can be opened and its contents removed. As it passes out it strikes a trigger which removes a valve and admits air to the upper end of the cylinder instantly closing the gate and preventing the escape of the air circulating in the tube.

There is another form of terminal apparatus called the closed receiver in which the receiving tube terminates in a short closed section, mounted on trunions so that it can swing in a vertical plane. When the carrier shoots into this pivoted section, the carrier compresses the air ahead of it, thus bringing itself to rest. At the same time this pressure operates a valve which admits air to a pneumatic cylinder, the piston of which is connected to the pivoted cylinder and causes it to tip down. The carrier is thus allowed to slide out into a spring holder from which it rolls upon a table.

PNEUMONIA. See PUBLIC HEALTH and SERUM THERAPY.

POLAND, JOHN S., Brigadier-General, U. S. A., died in Asheville, North Caro-

lina, August 8, 1898. He was born at Princeton, Indiana, October 14, 1836; was graduated at West Point in 1861, and after serving with the Army of the Potomac from Bull Run to Gettysburg, he was ordered to the defenses of Washington. In 1863 he became Lieutenant-Colonel by brevet. He held various commands after the war, and in 1891 was promoted to the colonelcy of the Seventeenth Infantry. Upon the outbreak of the Spanish-American War, Col. Poland was made Brigadier-General, commanding a brigade in camp at Chickamauga Park. Here he contracted the fever which terminated his life.

POLONIUM is an elementary substance which has not yet been isolated. It is said to resemble bismuth. It has been discovered in pitchblende (U_3O_4) in the form of a sulphide, and has a radiating power 400 times that of uranium, which is found in the same mineral. See also **PHYSICS**.

POLYNESIA, BOTANY OF. See **BOTANY**.

POLYNESIA, FLORA OF. See **BOTANY** (paragraph Systematic Botany—Polynesia).

POMPEIAN DISCOVERIES. See **PAINTING**.

POOL, MARIA LOUISE, American authoress, died on May 19, 1898. She was born in East Abington, Mass., in 1841; was educated at the schools in that town and prepared herself for the work of teaching, but soon abandoned that calling and devoted herself to literary work. Her first venture was a series of sketches dealing with New England life and character. Among her works may be mentioned, *A Vacation in a Buggy*; *Roweny in Boston*; *Dally*; *Against Human Nature*; *Mrs. Keats Bradford*; *Katherine North*; *In the First Person*; *In a Dyke Shanty*; and *Mrs. Gerald*.

PORTER, JOHN ADDISON, Secretary to President McKinley, was born in New Haven, Connecticut, April 17, 1856; was graduated at Yale College in 1878. In 1884 and 1887 Mr. Porter was Secretary to Representative William Walter Phelps, and Senator Orville H. Platt, of Connecticut; in 1893 he was a Representative in the State legislature, and in the Republican State conventions of 1894, and 1896 was presented as a candidate for Governor. On February 5, 1897, he was appointed Secretary to the President. Mr. Porter is the editor and proprietor of the *Hartford Post*.

PORTO RICO. See **PUERTO RICO**.

PORTUGAL. A kingdom of Europe occupying the western portion of the Spanish peninsula and having an area of 325,285 sq. m., with a population in 1890 of 4,660,095 on the mainland and, including the Azores and Madeira, of 5,049,729. The capital is Lisbon with a population of 301,206. The chief products include maize, rye, wheat, wine, olive oil, fruit, potatoes and other vegetables. Live-stock is raised also in considerable numbers and the country is rich in minerals, although there is a lack of coal. As to its commerce, the chief exports are wine, cork, animals and animal products, copper and cotton tissues and the chief sharers in this foreign trade are Great Britain, Germany, Spain, Brazil, France and the United States. During the year ending January 30, 1898, Portugal imported from the United States goods to the value of \$3,532,657, and exported to that country goods to the value of \$2,605,323. The budget estimates for the year 1898-99 give for the total revenue 52,805,943 milreis and for the total expenditure 52,655,037 milreis, the milreis being valued in United States currency at \$1.08. The army which is maintained part by conscription and partly by voluntary enlistment, numbered on July 1, 1898, 15,000 men. There are, besides, a municipal guard, a fiscal guard and a colonial army, the last-named numbering about 9,000 men in 1898. By the law of September, 1895, service is required for 3 years with the colors, 5 years in the first reserve and 4 years in the second reserve. The navy in 1896 included 1 armored cruiser, 5 protected cruisers, 6 third-class cruisers, a torpedo flotilla and a number of gun-boats of various classes. In 1898 the newer vessels comprised the *Adamastor*, 1,933 tons, the *Reinha Amelia* of somewhat lower tonnage. A fifteen-knot cruiser, the *San Gabriel*, was launched in 1898 and there were several vessels in process of construction. The form of government is that of a constitutional monarchy, the executive authority being vested in the King (Carlos I in 1898) and two legislative chambers, the House of Peers and the Chamber of Deputies. There is a responsible cabinet of seven ministers. The colonies of Portugal have an area estimated at 801,060 sq. m., with a population of 9,216,707. In Africa they include Portuguese Guinea, Angola, Portuguese East Africa, Cape Verde Islands, Prince's Island and St. Thomas Islands. In Asia the Indian possessions of Goa, Damao in Diu; and the Indian Archipelago and the Chinese Island of Macas. An account of the most important possessions of Portugal in Africa is given under the titles Angola, Portuguese East Africa and Portuguese Guinea (qq. v.).

PORTUGUESE GUINEA, on the western coast of Africa between British Cambia on the north and French Guinea on the south, has an area of about 4,440 sq. m.,

and a population of about 820,000. Its chief port is Bissau. Its chief products and exports are rubber, wax, oil, seeds, and hides. Its boundary with French Guinea was fixed by a convention in 1886.

POSTAL MICROSCOPICAL CLUB, AMERICAN, organized in 1875 for the purpose of circulating slides prepared by physicians and others throughout the United States. President, R. H. Ward, M. D., Troy, N. Y.; Secretary, S. G. Shanks, M. D., 547 Clinton avenue, Albany, N. Y.

POTATOES. The following table published by the department of Agriculture shows the acreage, production and value of Irish potatoes in the United States in 1898:

States and Territories.	Area. Acres.	Production. Bushels.	Value.
Maine	45,946	5,972,980	\$2,747,571
New Hampshire	18,850	1,696,500	831,285
Vermont	25,686	2,697,030	1,132,753
Massachusetts	27,515	2,668,955	1,681,442
Rhode Island	6,935	853,005	545,923
Connecticut	25,309	2,530,900	1,391,995
New York	332,885	24,300,605	10,206,254
New Jersey	46,558	3,491,850	2,130,028
Pennsylvania	172,441	9,311,814	5,400,852
Delaware	5,136	251,664	173,648
Maryland	21,973	1,274,434	675,450
Virginia	35,799	2,434,332	1,338,883
North Carolina	16,132	1,080,844	670,123
South Carolina	4,100	266,500	266,500
Georgia	5,651	305,154	228,866
Florida	1,813	116,032	139,238
Alabama	6,519	482,406	400,397
Mississippi	5,651	418,174	301,085
Louisiana	8,830	688,740	516,555
Texas	13,425	1,047,150	900,549
Arkansas	26,553	1,964,922	1,080,707
Tennessee	27,453	1,427,556	813,707
West Virginia	36,394	2,256,428	1,218,471
Kentucky	41,365	2,647,360	1,217,786
Ohio	170,572	10,404,892	4,266,006
Michigan	178,541	14,104,739	3,808,280
Indiana	93,984	6,672,864	2,735,874
Illinois	164,648	11,525,360	5,301,666
Wisconsin	153,272	15,020,656	3,604,957
Minnesota	110,119	9,360,115	2,340,029
Iowa	204,617	16,369,360	4,910,808
Missouri	95,763	6,320,358	2,780,958
Kansas	98,659	6,906,130	3,522,126
Nebraska	140,745	9,148,425	3,384,917
South Dakota	55,267	3,979,224	1,114,183
North Dakota	30,156	2,623,572	892,014
Montana	4,551	473,304	260,317
Wyoming	3,459	415,080	269,802
Colorado	33,303	2,564,331	1,384,739
New Mexico	734	42,572	33,206
Arizona .....	.....	.....	.....
Utah	5,187	700,245	217,076
Nevada	1,362	211,110	189,999
Idaho	4,277	513,240	277,150
Washington	14,390	1,554,120	606,107
Oregon	14,786	1,271,596	597,650
California	20,418	1,939,710	1,066,840
Oklahoma .....	.....	.....	.....
Indian Territory .....	.....	.....	.....
Total	2,557,729	192,306,338	\$79,574,772

POTTER, THOMAS BAYLEY, one of the founders of the Cobden Club in England. died in November, 1898. He was born in Manchester in 1817, educated at Rugby and University College, London and afterwards gained a prominent place among the merchants of Manchester. During the American Civil War he distinguished him-

self by his constant advocacy of the Union cause. In 1865 he was elected to Parliament as a member for Rochdale, and represented that constituency in the Liberal interest for thirty years. He was associated actively with the Cobden Club from its beginning. He supported Cobden and Bright and later Gladstone and was for many years one of the leading Liberals of England.

POWELL, MAUD, violinist, born in Aurora, Ill., in 1868. She studied the violin with William Lewis in Chicago, Schradieck in Leipzig, Dancla in Paris, and Joachim in Berlin. Her first appearance was made with the New York Philharmonic in 1885 under Thomas, playing Bruch's G-minor concerto. Her reputation has been honestly gained and she stands at the head of American women violinists. In 1898 she went to London, where she has met with success.

PRESBYTERIAN CHURCH OF THE U. S. (NORTH) has not had a satisfactory year as usual. The total additions were 57,041, just 30 above the additions of 1896-97, and 17,785 less than in 1893-94. The total contribution to the boards was \$2,407,361, \$12,919 less than in the preceding year; the board of home mission's debt was increased by \$20,000, being now \$167,839. The board of education has a debt of \$7,720, and the board of missions for freedmen, \$57,477. The Presbyterian church was in sympathy with the Cuban War and the missionary boards are planning work for the new fields opened. The Rev. D. Stuart Dodge was elected president of the board of home missions, to fill the vacancy caused by the death of Dr. John Hall, and Dr. Charles L. Thompson was chosen secretary. At the last General Assembly the 250th anniversary of the Westminster Assembly of Divines was celebrated. The church felt the loss of Dr. John Hall, Dr. William C. Cattell, ex-Secretary of the board of Ministerial Relief, and Dr. Samuel A. Muchmore, for many years editor of *The Presbyterian*. The two periodicals, *The Assembly Herald* and *The Church at Home and Abroad* were amalgamated under the former's name, with Rev. Albert B. Robinson as editor. The Assembly reported adversely upon the orthodoxy of Prof. A. C. McGiffert's *The Apostolic Age*, and notified the author either to modify the expression of his views or to resign from the Presbyterian church. The Presbyterians now have 7,635 churches, 7,190 ministers, eight missionary and benevolent boards, 14 theological seminaries, and 4,177 missionaries (over 2,000 being in foreign lands), and the amount of \$14,000,000 was raised for home and foreign missions. The latest report of the commissioner of education shows that the Presbyterians control 54 institutions of higher education, with 459 officers of instruction, 4,087 students, and endowment funds amounting to \$5,133,295.

PRESBYTERIAN CHURCH OF THE U. S. (SOUTH) gained a considerable increase in membership in the year 1898, having an addition of 5,400 members. The best work was accomplished by its foreign missions, and the Congo mission promised the largest results. It was resolved that a separate church for colored Presbyterians should be tried, and arrangements for their first Synod to meet in Chester, S. C., in January, 1899, were perfected. Two ministers withdrew from the Church, owing to opposition to the Westminster standards. Dr. R. L. Dabney, Dr. John L. Girardeau, and Dr. T. D. Witherspoon, who died during the year, were men whose influence will be missed. The Union Theological Seminary of Hampden Sidney, Va., was removed to Richmond, Va., and opened with the largest number of students in its history. This body now consists of 2,873 churches, 1,448 ministers, and 217,075 members.

PRESBYTERIAN CHURCH IN ENGLAND, consists of 12 presbyteries, 311 congregations, 31 preaching stations, and 71,444 communicants. Westminster College, Cambridge, is its theological school. It supports 54 foreign missionaries, 22 of whom are women. £270,577 were raised in 1896. The moderator for 1899 is Rev. William Hutton, Birkenhead.

PRICE, BARTHOLOMEW, D. D., F. R. S., F. R. A. S., Master of Pembroke College, Oxford, and Canon of Gloucester, died December 29, 1898. He was born in Gloucestershire, May 14, 1818; was educated privately and at Pembroke College, where he became a fellow in 1844 and was tutor from 1846 to 1857, being appointed in 1853 Sedleian professor of natural philosophy. His publications include: *A Treatise on the Differential Calculus* (1848), *a Treatise on Infinitesimal Calculus*, including *Differential Calculus* (1852), *Integral Calculus and Calculus of Variations* (1854), *Statics and Dynamics of a Particle* (1856), and *Dynamics of Material Systems* (1862).

PRIMITIVE METHODISTS OR RANTERS, a sect dating from 1810. Their headquarters are at Fall River, Mass., where is published their official paper, in which a history of their organization has been printed. This will soon be issued in book form. In 1898 they established a board of education to plan a School of Theology, and collected a fund of \$10,000 to provide for their superannuated ministers. Their home missions report better results than their foreign missions. The

church numbers 180 ministers, 90 churches, 6,100 members, 100 Sunday schools, 12,063 scholars and church property valued at \$440,000.

PRINCE EDWARD ISLAND is a province of the Dominion of Canada situated in the Gulf of St. Lawrence and having an area of about 2,000 sq. m. with a population in 1891 of 109,078. Its capital is Charlottetown with a population of 11,374. In 1897 the number of Indians was 303, cultivating 130 acres of land and receiving \$9,545 for their industrial products and \$1,537 from the regular parliamentary grant. Prince Edward Island has a very fertile soil well fitted for the production of all the cereals and vegetables grown in a temperate climate.

Fisheries.—In the calendar year 1896, the value of all fishery products was \$976,126; principal catches: lobsters, \$284,019; herring, 224,110; oysters, \$120,856; and cod, \$102,686. The value of all apparatus employed in the industry was \$371,991; value of exports of all fishery products (1897), \$494,281.

Commerce.—The imports of merchandise in the year ending June 30, 1897, aggregated in value, \$416,547; duties collected, \$110,138; exports, \$1,314,607. The registered sea-going tonnage carrying cargoes into and out of the province averaged for the year 107,960, and the tonnage of all vessels, British and foreign, employed in the coasting trade, which arrived at and departed from local ports, was 1,209,602. To facilitate navigation there were 36 light stations, with a total of 58 lights.

Banks.—On June 30, 1897, there were 9 post-office savings banks, with 1,362 depositors, and \$335,648 deposits, and one government savings bank, with 5,340 depositors, and \$1,832,839 deposits. In the latter bank the deposits and interest of the year amounted to \$395,010, and the withdrawals, \$731,786.

Railways and Post-Offices.—The Prince Edward Island Railway, built and owned by the Canadian government, has a total length of 210 miles. In 1897 its capital account was \$3,750,565; total earnings, \$153,443; operating and other expenses, \$240,490; deficit, \$87,047. During the year it transported 121,498 passengers and 52,147 tons of freight. There were 406 post-offices, which handled in the year 1,330,000 letters and 190,000 postal cards, and 15 money-order offices, which issued 9,431 orders.

Government.—Public affairs are administered by a Lieutenant-Governor, an Executive Council of 6 members, half without portfolios, and a legislative assembly of 30 representatives, who receive \$160 per annum each. The legislature is practically the governing body of local improvements. The judicial system comprises an Admiralty District Court, a Superior Court consisting of a Chief Justice and two Associate Justices, and several minor courts, all based on English law. Early in August, 1898, the Warburton ministry was replaced by that of Hon. Donald Farquharson.

Education.—Educational matters are under the control of a Board of Education appointed by the government, and of a Chief Superintendent, and are supported partly by government grants and partly by district assessments. In 1897 there were 467 schools, with 21,845 enrolled pupils, an average attendance of 12,978, and 570 teachers. The expenses were \$161,444, of which \$128,663 was from the government grant and \$32,781 from the school board. There were 3 public libraries, with 8,528 volumes, and (1898) 16 periodicals, chiefly weeklies.

Finances.—In the year ending Sept. 30, 1897, the revenue was \$272,550; expenditure, \$310,752; gross debt, \$362,284; Dominion government debt allowance, \$182,176; other assets, \$11,844; net debt, \$168,264.

PRINCETON UNIVERSITY, called the College of New Jersey until October 1896, at Princeton, New Jersey, is non-sectarian, but closely affiliated with the Presbyterian denomination, and is for men only. Founded in 1746; President, Francis Landey Patton, D. D., LL. D.; the libraries, exclusive of pamphlets and duplicates, contained, in 1898, 193,183 volumes. For the year 1898-99 the officers of instruction number 85, and the student enrollment is as follows: graduate students, 128; academic undergraduates, 663; students in the electoral school, 4; scientific undergraduates, 334; total, 1,099. The degrees in course conferred June, 1898, were: D. Sc., 1; A. M., 39; M. S., 2; A. B., 120; E. E., 2; B. S., 53; C. E., 13; total, 330. The only LL. D. conferred at this time was upon Rear-Admiral George Dewey. (See PSYCHOLOGY EXPERIMENTAL and UNIVERSITIES AND COLLEGES.)

PRISM SPECTRUM. See PHYSICS (paragraph A Simple Interpolation Formula for the Prismatic Spectrum).

PROTECTIVE ASSOCIATION, AMERICAN, a secret society, founded in 1887 at Clinton, Ia., by H. F. Bowers, has grown to large proportions, and spread to Canada, England, and Australia. It is now organized as an international movement with a platform adopted in 1894 by the Supreme Council, held in Des Moines, Ia. This supports the American Constitution and institutions and opposes the Jesuit influence.

PROTECTIVE TARIFF LEAGUE, AMERICAN, organized in 1885 consists of 950 members. President, William L. Strong; Secretary, Wilbur F. Wakeman. Headquarters, 135 W. 23rd street, New York.

PROTESTANT EPISCOPAL CHURCH. The year of 1898 was one of peace and prosperity. The triennial General Convention was held in Washington; the Church Congress met in Pittsfield in the early summer, when foreign missions, the moral attitude of corporations, and the development of doctrine were discussed; and the St. Andrews' Brotherhood met in Baltimore. At the Convention in Washington, which met in the Church of the Epiphany, and was attended by five or six hundred members, Bishop Doane, of Albany, was chosen to preside over the house of bishops, and Dr. Dix, of Trinity, New York, over the clerical and lay-deputies. The matters of most interest discussed were the framing of a new canon of marriage and divorce and the election of a new Secretary to take the place of Dr. Langford (deceased), on the Board of Missions; but none of these affairs were decided. An article was enacted regarding church unity, making it possible to erect an appellate court and an article preliminary to the division of the church into provinces. The convention was memorable for a pilgrimage made to Jamestown, Va., where the first Episcopal church in America was built in 1607. Dr. McKim, of Washington, made the historical address.

During this convention the Peace Cross was unveiled at St. Alban's Mount, near Washington. President McKinley delivered one of the addresses on this occasion. The next Triennial Convention will be held in San Francisco in October, 1901. There are now (including missions abroad) 77 dioceses and missionary districts, 85 bishops, 4,874 clergymen, and 685,343 members, of which 21,236 were added in 1898. The Commissioner of Education's report (published January 1, 1899), shows that the Protestant Episcopal Church has five institutions with 66 teachers, 449 students and endowments of \$1,733,994.

The bishops and dioceses are: Alabama, R. H. Wilmer and H. M. Jackson; Arizona and New Mexico, T. M. Kendrick; Arkansas, H. N. Pierce; Boisc, James M. Funsten and James M. Brown; California, W. F. Nichols; Sacramento, Wm. H. Moreland; Los Angeles, J. H. Johnson; Colorado, J. F. Spaulding; Connecticut, John Williams; Delaware, L. Coleman; Florida (N), E. G. Weed, (S), W. C. Gray; Georgia, C. K. Nelson; Illinois—Chicago, W. E. McLaren; Springfield, G. F. Seymour; Quincy, Alex. Burgess; Indiana, John H. White; Kansas, F. R. Millsbaugh; Kentucky, T. U. Dudley; Lexington, L. W. Burton, Louisiana, Davis Sessums; Maine, H. A. Neely; Maryland, W. Paret; Easton, W. F. Adams; Washington, H. Y. Satterlee; Massachusetts, W. Lawrence; Michigan, (E), T. F. Davis; (W), G. N. Gillespie; Marquette, G. M. Williams; Minnesota, H. B. Whipple; Duluth, J. D. Morrison; Mississippi, H. M. Thompson; Missouri, D. S. Tuttle; West Missouri, E. R. Atwell; Montana, L. R. Brewer; Nebraska, G. Worthington; Laramie, A. N. Groves; New Hampshire, W. W. Niles; New Jersey, J. Scarborough; Newark, T. A. Starkey; New York, H. C. Potter; Central, F. D. Huntington; Albany, W. C. Doane; Long Island, A. N. Littlejohn; Western, W. D. Walker; North Carolina, J. B. Cheshire, Jr.; East Carolina, A. A. Watson; North Dakota, Julius M. Horner; Ohio, W. A. Leonard; Southern, T. A. Jaggar; Oklahoma—Indian Tribes, F. K. Brooke; Oregon, B. W. Morris; Pennsylvania, O. W. Whitaker; Pittsburg, C. Whitehead; Central, E. Talbot; Rhode Island, T. M. Clark; South Carolina, Ellison Capers; South Dakota, W. H. Hare; Tennessee, T. F. Gailor; Texas, G. H. Kinsolving; Western, J. S. Johnson; Dallas, A. C. Garrett; Salt Lake, A. Leonard; Vermont, Arthur C. A. Hall; Virginia, F. McN. Whittle; Southern, A. M. Randolph; West Virginia, G. W. Peterkin, Parkersburg; Wisconsin—Milwaukee, I. L. Nicholson; Fond du Lac, C. C. Grafton; Washington, Olympia, W. M. Marker; Spokane, L. H. Wells; Africa, S. D. Ferguson; China, Shanghai, F. R. Graves; Japan, J. McKim; Brazil, L. L. Kinsolving; Haiti, J. T. M. Holly; Iowa and Kyoto are vacant.

PROTOPLASM, VEGETAL. See BOTANY (paragraphs Cytology, Plant Physiology).

PRUSSIA, the largest of the German kingdoms, occupies nearly all the northern part of Germany. It has an area of 134,537 sq. m. with a population, according to the census of December 2, 1895, of 31,855,123, but a later estimate places it at about 35,000,000. In 1896 the total number of births was 1,226,107, and the deaths, excluding the still-born, were 666,677. The greater part of the rural population is supported by agriculture. The chief products include wheat, rye, barley, oats, potatoes and hay. The mineral resources are considerable, the most important mineral product being coal, the output of which has greatly increased during the latter half of the nineteenth century, having risen from 17,571,581 tons in 1848 to 78,993,655 tons in 1896. The production of lignite has also increased enormously. In the former year it was about 8,000,000 tons and in the latter 21,981,201 tons. Like the other States of the German empire, Prussian manufacturing and commerce are developing rapidly.

Elections in 1898.—An important event of the year was the election to the Landtag. This body contains in all 433 members, who are chosen by indirect election. Electors in the second degree are chosen in the ratio of one for every 250 inhabitants and

these choose the Deputies. The electors of the second degree are divided into three classes in each district, according to the amount of taxes which they pay to the general and local governments. Each class has an equal number of electors, and wealth therefore governs in the matter of representation, a wealthy elector often having a hundred or even a thousand times as much weight in elections as an elector belonging to the poorer class. This plutocratic system of elections, as it has been called, has been bitterly opposed by some political writers. It would seem that there was hardly any hope for the poorer class of electors. Nevertheless, the Socialists decided at their convention at Hamburg to take part in the Prussian elections, hoping at least to make a demonstration of their power. The conservative element lacked only a few votes of a majority in the Landtag during the preceding legislative session. In the 1898 elections the other parties united against them. These parties include the Centre, the National Liberals and the two Liberal parties, the last-named being recruited from the ranks of the Socialists. The efforts to unite the opposition were not successful, and although the Liberal parties made some gains, the result of the elections was to give the Conservatives and Independent Conservatives 201 seats; the Centre 97 seats; the National Liberals, 78 seats; the Liberal Democratic Party, 24 seats; the Union Liberal Party 11 seats; the Poles 15 seats, and the Independents 7 seats. See GERMANY.

PSYCHICAL RESEARCH, is the investigation of those mental manifestations which the science of psychology has, until the most recent years, considered to be without the scope of its own researches, which have been mostly confined to the adult human and so-called normal mind. Psychical research, however, takes as its object the occult nature of mind and matter. A Society for Psychical Research was founded in England in 1882, of which the President in 1898 was Sir William Crookes, F. R. S. and the membership was 900. There is an American Branch, founded in 1895, with headquarters in Boston and a membership of 450, of which Dr. Richard Hodgson is the Secretary and Treasurer. The objects of investigation have been telepathy, hypnotism, apparitions, double personality, clairvoyance, automatic writing, subliminal consciousness, dreams, suggestion, crystal-gazing, the divining rod and the phenomena of trance. The results of the Society's work in the subject of trances of "mediums" have been summed up for 1898 in the article Spiritualism (q. v.). In his address before the British Association at Bristol (September, 1898), the President, Sir William Crookes, F. R. S., recognized the great value of the work of the Society for Psychical Research and was particularly emphatic in his acceptance of the facts of telepathy or the communication of ideas from brain to brain, without dependence upon the ordinary channels of sense communication, and touched upon alternating personality and psycho-therapeutics in the following words:

"Confirmation of telepathic phenomena is afforded by many converging experiments, and by many spontaneous occurrences, only thus intelligible. The most varied proof perhaps is drawn from analysis of the sub-conscious workings of the mind, when these, whether by accident or design, are brought into conscious survey. Evidence of a region below the threshold of consciousness has been presented, since its first inception, in the *Proceedings* of the Society for Psychical Research, and its various aspects are being interpreted and welded into a comprehensive whole by the pertinacious genius of F. W. H. Myers. Concurrently our knowledge of the facts in this obscure region has received valuable additions at the hands of laborers in other countries. To mention a few names out of many, the observations of Richet, Pierre Janet and Binet (in France); of Breuer and Freud (in Austria); of William James (in America) have strikingly illustrated the extent to which patient experimentation can probe subliminal processes and can thus learn the lessons of alternating personalities and abnormal states. Whilst it is clear that our knowledge of sub-conscious mentation is still to be developed we must beware of rashly assuming that all variations from the normal working condition are necessarily morbid. The human race has reached no fixed or changeless ideal; in every direction there is evolution as well as disintegration. It would be hard to find instances of more rapid progress, moral and physical, than in certain important cases of cure by suggestion—again, to cite a few names out of many—by Liébault, Bernheim, the late Auguste Voisin, Bérillon (in France), Schrenck-Notzing (in Germany), Forel (in Switzerland), van Eaden (in Holland), Wetterstrand (in Sweden), Milne Bramwell and Lloyd Tuckey (in England). This is not the place for details, but the *vis medicatrix* thus evoked as it were from the depths of the organism, is of good omen for the upward evolution of mankind."

Psychical Research at American Universities.—At a number of universities in the United States psychical research is given some recognition in courses of lectures. At Harvard, Professor William James lectures upon abnormal psychology, giving about a third of the time to an account of psychical research work. His lectures are, however, the only notice taken of this branch of psychology in that university. At Yale and Cornell Universities the attitude toward psychical research is one of strong op-

position, the director of the psychological laboratory at Yale having warned his students "against the unjustifiable application of the term 'experiment' to hypnotic exhibitions, to thought transference follies, and to the so-called psychical research experiments. These amusements are as unrelated to scientific experiments as clairvoyant healing and faith cure to the science of medicine." (Scripture: *Thinking, Feeling and Doing*.) At Cornell the authorities will not even allow the *Proceedings* of the Society for Psychical Research to be in the university library, fearing that they would inflame the imagination and corrupt the minds of the students. At Clark University the attitude of the President and eminent psychologist, G. Stanley Hall, has changed from one of acceptance to one of doubt after having read all the reports of the Society for Psychical Research and having repeated almost all their experiments. Psychical research is noticed in the regular courses of lectures on psychology at the University of Pennsylvania, Brown University, the University of Chicago, Smith College, Columbia University, and the University of Minnesota. Professor Harlow Gale, of the last-named University, says: "I deliberately believe that for immediate practical returns in education, the Society for Psychical Research has more to offer than all the psychological laboratories. At the University of Iowa, Professor Patrick has devoted considerable time to the study of automatic writing. (See PSYCHOLOGY, EXPERIMENTAL, paragraph University of Iowa.) At Columbia University Professor J. H. Hyslop is conducting elaborate experiments bearing upon the identification of personality and the spiritistic doctrine of the recently observed phenomena of trance (see SPIRITUALISM): but Professor J. McK. Cattell, director of the laboratory of experimental psychology and co-editor of the *Psychological Review*, does not admit the value of psychical research work.

PSYCHOLOGICAL ASSOCIATION, AMERICAN, organized in 1892 "for the advancement of psychology as a science." Membership 100. The seventh annual meeting of this society was held at Columbia University, New York, on December 28-30, 1898. At the business meeting Professor John Dewey, of the University of Chicago, was elected President, and Dr. Livingston Farrand of Columbia University, Secretary and Treasurer for the year 1899. At the different morning and afternoon sessions the following topics were discussed: *Psychology and History*, by Prof. Münsterberg of Harvard University; *The Relations of Will to Belief*, a discussion by Professors Ladd, Hibben, Caldwell and Armstrong; *The Development of Voluntary Motion*, by E. A. Kirkpatrick; *The Effects of Cannabis Indica*, by Prof. E. B. Debarre (see PSYCHOLOGY, EXPERIMENTAL), of Brown University; *Hindrances to the Progress of Psychology in America*, by Professor Ladd of Yale; *Reason, a Mode of Instinct*, by Henry Rutgers Marshall; *Animal Intelligence and the Methods of Investigating It*, by Wesley Mills (see PSYCHOLOGY); *Psychological Classifications*, by Prof. Mary W. Calkins, of Wellesley College; *Instruments for the Study of Movement and Fatigue*, by Prof. J. McK. Cattell of Columbia; *The Psychological Basis of Mental Life*, by Professor Münsterberg; *On the Confusion of Tastes and Odors*, by Professor G. T. W. Patrick, of the University of Iowa (see PSYCHOLOGY, EXPERIMENTAL); *Methods of Demonstrating the Physiology and Psychology of Color and Recent Investigations at the Yale Laboratory* (see PSYCHOLOGY, EXPERIMENTAL), by Dr. Scripture of Yale; *Measurements of Pain*, by Arthur MacDonald (see PSYCHOLOGY, EXPERIMENTAL) and *A Study of Geometrical Illusions*, by Professor Chas. H. Judd of New York University.

PSYCHOLOGY. During the year 1898 the relation between psychology and education has received special attention and discussion at the hands of some of the most eminent psychologists of America. The question is of the greatest importance, as the methods of psychological research known as the questionnaire have been introduced into the educational world, and a great mass of data is being collected, the value of which is strongly doubted by certain well-known investigators. The questionnaire is a series of questions framed for the purpose of eliciting from the subjects to whom it is given, certain psychological peculiarities such as the nature of their imagination or mental imagery, and it has been proposed that the errors in introspection committed by the persons answering the questions would cancel each other, if a large enough number of returns were obtained, and that the result would be of great scientific value. In other ways, too, teachers having become, in many parts of the country, interested in psychology, and learning of the simplicity of some of the methods of experimental psychology, have performed experiments on their classes, where, with some of the psychological instruments, a large body of data can be easily and quickly obtained. The interpretation of these data has given rise to the most diverse views. On the one hand, some psychologists consider them to be of value in the study of the relation between the art of teaching and the science of psychology, and claim in addition that the teachers who have entered the field of psychology have acquired an insight into human nature and the youthful mind in its period of plasticity such as to increase very much the effectiveness of their labors. On the contrary others have declared that to use psychology at present, as the handmaid of education, is premature. Indeed Professor J. M. Baldwin, of Princeton Uni-

versity, condemns the whole of child-study as thus carried on, in the following words: "Child-study is a fad, a harmless one, for the most part; indeed a beneficial one to those teachers who lacked humanity before and are now finding it in their attitude toward their pupils. But it is an insult to the teaching profession to tell them that their humanity needs this sort of cultivation, and to hood-wink them into thinking that they are making contributions to science." Professor Münsterberg, of Harvard University, not only condemns the unscientific use of psychological methods by those not trained in psychology, but sounds a warning note to all, against even the professional experimental psychologists. He says: "This rush of the teachers towards experimental psychology is an absurdity," and adds that, psychology bears the same relation to education that physiology does to medicine, and as no one ever became a good physician merely by the study of physiology, so no one will become a good teacher by the study of psychology alone.

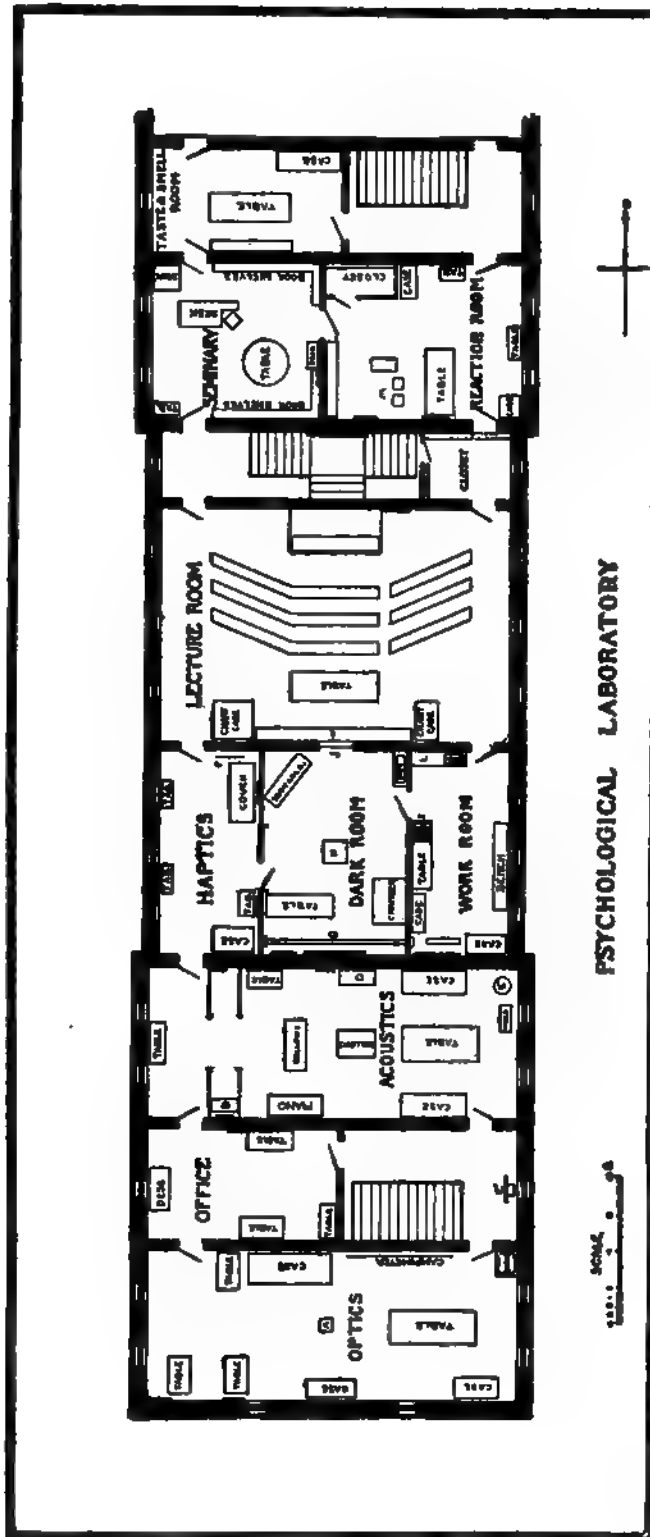
The year 1898 saw the production of several notable works on comparative psychology. A translation of Karl Groos's *Die Spiele der Thieren*, appeared early in the year, together with *Evolution Ethics and Animal Psychology* by E. P. Evans. The latter maintains that the minds of animals exhibit a high degree of development, and Professor Wesley Mills's *The Nature and Development of Animal Intelligence* was written from the same point of view. An opposite view-point was that of Dr. E. L. Thorndike, who, in his *Animal Intelligence; an Experimental Study of the Associative Processes in Animals*, attempts to prove that there is no ground for ascribing either memory-images or other free ideas to any except human intelligence. (See PSYCHOLOGY, EXPERIMENTAL, paragraph Columbia University.) Among other books of interest from a psychological point of view, which have appeared during 1898 may be mentioned: Boris Sidis's *The Psychology of Suggestion*, in which the author shows that the sub-conscious or secondary personality, which has been so prominently manifested in certain cases of hysteria and other forms of mental disease is to be found, in some degree of development, in all persons whether mentally normal or otherwise; and Professor William James's *Human Immortality*, which considers two supposed objections to the doctrine. For a more detailed account of the progress of psychology during 1898 see the following article.

PSYCHOLOGY, EXPERIMENTAL, is that branch of psychology which endeavors by means of instruments and a laboratory to ascertain accurately the time relations and other quasi-physical relations of mental phenomena. An account of the progress of experimental psychology during the year 1898 will be given in the form of reports upon the work done during the year in a number of the psychological laboratories. In experimental psychology the American laboratories now stand preëminent both as to equipment, attendance and quality of work done; and the number of American students going abroad to study psychological methods, attracted by the renown of French and German psychologists and by the facilities of continental laboratories is yearly becoming less. Almost the entire work in experimental psychology is done in laboratories attached to the different leading universities, both in the United States and abroad. The most famous is that of the University of Leipsic, of which the philosopher Wilhelm Wundt is director, and there are others at Berlin, Göttingen, Würzburg, Bonn, Breslau and elsewhere. In the United States the leading psychological laboratories are at Harvard, Yale, Columbia, Cornell, Princeton, Clark, Leland Stanford, Jr., Brown Universities, and the Universities of California, Chicago, Iowa and Pennsylvania. Good laboratories are to be found also at the University of Michigan, New York University, Wellesley College and Wesleyan University.

The use of the laboratory in the U. S. is two-fold, (1) to give practical demonstrations in a course of instruction to undergraduate students, showing the factors of sensation, perception and other mental phenomena; and (2) to afford the facilities for post-graduate scientific work which contributes to the more exact knowledge of the laws of mental phenomena.

The construction and equipment of a psychological laboratory may best be illustrated by the description of that at Cornell University.* It is composed of ten rooms on the upper floor of one of the university buildings. One room, called the optics room is used for experiments upon the sense of sight; being so constructed that it can be made dark and the subject may be given any thing, as a stimulus to the sense of sight, from a slight spark up to an illuminated wall. Another called the acoustics room is used for experiments on the sense of hearing and is made as impervious to sound as possible, so that the attention of the subject may be concentrated upon the sound which is made, by a bell or otherwise, for him to respond to. Another, called the *haptics* room is used to perform experiments upon the sense of touch and other sensations. Besides these there are rooms especially devoted to taste, smell and reaction time, and a workshop where many of the instruments are made; and a lecture room where lectures and

*See *Mind* N. S., No. 27, July 1898, pp. 311-331.



PSYCHOLOGICAL LABORATORY

EXPLANATION OF DIAGRAM.

- A*.—Color mixer.
B.—Fall photometer.
C.—Curtains to prevent echo.
D.—Harmonical.
E.—Air-pump. *E'*.—Tank for compressed air.
F.—Arm movement apparatus.
G.—Photometer bar.
H.—Lantern stand.
I.—Ground glass screen for projection.
K.—Resistance frame.
L.—Vanishing tray.
M.—Chronograph and accessories.
N.—Direct current attachments.
O.—Switch boards.

demonstrations are given to the undergraduate classes. All the rooms are connected by an elaborate system of electric wires which enable the investigator to be in one room while his subject is in another, isolated from all interruption. Electricity is used also for light and for power to drive sundry small motors. The laboratory is further equipped with a special library. As the library is used both for research and for instruction there is a separate set of instruments for each purpose. The Cornell laboratory has been established at a total cost of nearly \$6,000; though a good working laboratory can be started for a very small sum, even as little as \$50.

A short summary of certain of the more important and more interesting of the researches carried on and the results arrived at in experimental psychology during the year 1898, at the principal laboratories of the U. S. follows, under the heads of the various universities maintaining them, preceded by an account of the sensibility to pain, made by the government specialist in education, as related to abnormality. This specialist, Mr. A. MacDonald, in an experimental study of children made numerous experiments with his temporal algometer, a small instrument by which the intensity of pressure of a brass disk upon the temples of the subject is measured in grams. The subject is told to say when he or she has the first slight feeling of pain, and the number of grams' pressure is recorded. Mr. MacDonald found that in general the sensibility to pain decreases as age increases, the left temple being more sensitive than the right. His subjects were of several classes of people widely differing in the circumstances of life. Girls in private schools were found to be much more sensitive to pain than those in public schools. University women are more sensitive than washerwomen, but less sensitive than business women, showing that there is no direct relation between intellectual development and pain sensitiveness. Girls in public schools are more sensitive at all ages than boys in public schools. Mr. MacDonald arrives at the following conclusions as to Washington school children: 1. As the circumference of the head increases, ability in studies increases. 2. Bright boys are in general taller and heavier than dull boys. 3. For a certain period of time before and after puberty, but at no other time, girls are taller and heavier than boys. 4. This pubertal superiority of girls is nearly a year shorter in the non-laboring classes than in the laboring classes. 5. Girls are superior to boys in their studies. 6. Children of the non-laboring classes show greater ability in their studies than children of the laboring classes. 7. Mixture of race seems to be unfavorable to the development of mental ability. 8. Girls show less variability in quality of their studies than boys. 9. As age increases, brightness decreases, in most studies, but not in the more mechanical studies, drawing, manual labor and penmanship. 10. In colored children brightness increases with age, contrary to the rule for white children. 11. Boys of the non-laboring classes show a much greater proportion of sickliness than boys of the laboring classes. 12. Defects of speech are much more frequent in boys than in girls. 13. Boys show a much greater proportion of unruliness and laziness than girls. 14. The dull boys have the highest percentage of unruliness. 15. Abnormalities in children are most frequent at the periods of dentition and puberty.

Harvard University.—The chief work in experimental psychology done during 1898 was on questions of touch sensations (contrast of touch, mixture of touch, tactual illusions compared with optical, especially fusion of touch); studies in inhibition (rivalry of optical impressions, inhibition of imaginative ideas, etc.); combination of feeling tones; suggestion (influence of various factors on choice); rhythm in poetry; principles of æsthetical composition especially symmetry; interference of several judgments; illusions of time, etc. About twenty students were at work upon these researches. Professor Münsterberg, who is authority for this list of researches carried on in the Harvard laboratory, has founded a small laboratory for demonstration and training purposes at Radcliffe College with apparatus costing \$1,000.

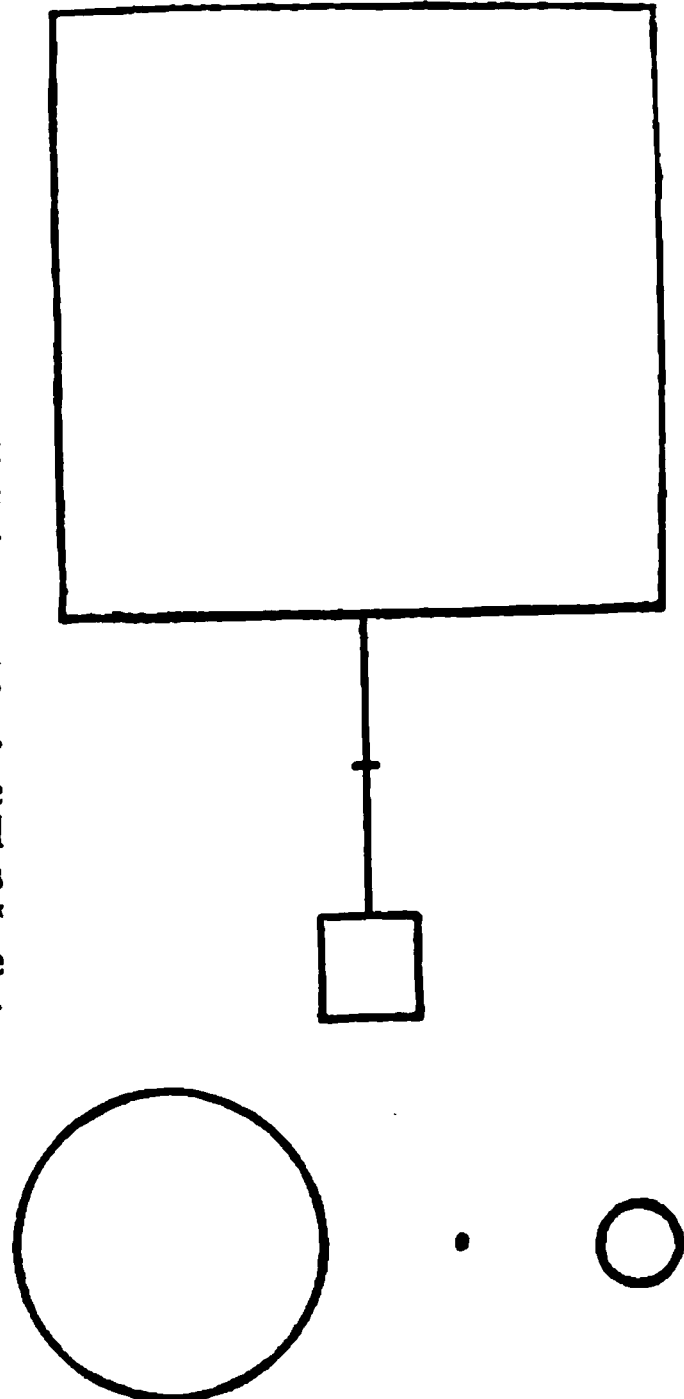
Among the researches at Harvard not mentioned in the foregoing list may be noticed that concerning the effects of study for examinations on the nervous and mental condition of female students, which demonstrated that at Radcliffe College the constant and fatiguing overstudy previous to examinations had not so deleterious an effect as would naturally be supposed. Another series of experiments upon cultivated motor automatism shows in an original manner the presence, in every normal person, of a subconscious personality more or less developed. The subject placing his hand on a planchette consisting of a square of board hung horizontally from the ceiling by a long wire would abstract attention from the hand and would read a book or engage in conversation. The experimenter would then impart to the hand, thus suspended and swinging freely, a motion of which the subject of the experiment was quite unconscious. After a short number of sittings this motion was learned by the hand without the knowledge of the subject, and was repeated. It was found that some persons did this better while their attention was actively engaged in another direction, and that others acquired the automatic motions better when the attention was merely drawn away from the hand, but not actively engaged.

Princeton University.—During 1898 the laboratory of experimental psychology at

Princeton University, of which Professor J. Mark Baldwin is director, was increased in effectiveness by adding to the library of the laboratory a collection of over seventy files of journals covering psychology, philosophy, neurology, anthropology and pathology. Subjects of investigation at Princeton were the psychology of counting and a new investigation of memory types, both by Professor Warren; experiments on the perception of two points upon various parts of the skin, a research on memory for pressure and sound intensities. Professor Baldwin conducted a research on type variations in reaction time (see below), another on an optical illusion which makes one judge the point half way between a large and a small square (or a circle) to be nearer the smaller one; and a research to test the hypothesis that differences of color-shade enter into the determination of the position in the retinal field. Besides these there was a research upon the temperature sense. It was found that the skin is sensitive to heat in certain minute spots supposed to be at the terminations of certain sensory nerves and is sensitive to cold in certain other minute spots. These heat spots and cold spots are distributed in great numbers over the body, but unevenly, so that some parts of the skin are very much less sensitive both to heat and to cold than are others. An unsuccessful attempt was made to get a chart of these heat and cold spots by the following method: A fine metal point was kept at a uniform (cold) temperature and moved slowly over the skin on the forearm. It is found that as this fine metallic point moves and attention is directed to the sensations to which it gives rise, that on certain spots it will feel *cold* while on others *no sensation of temperature will be felt*. When it was attempted to map out these "cold spots," however, it was found that they had not a constant position. Summing up the results of this experimenter, Professor Baldwin writes:*

"His results, put very briefly fail to confirm the theory that the sense of temperature has an apparatus of fixed spots for heat and other fixed spots for cold. * * * He finds, however, as other investigators have found, that the heat areas are generally in large measure separate from the cold areas, only to a certain extent overlapping here and there and also that there are regions of the skin where we have very little sense of either sort of temperature."

The experiments with regard to the differences of reaction time may be briefly described as follows: The subject is seated before a table on which is the key of an electric telegraph. A signal (such as a bell stroke) is given by a piece of apparatus which at precisely that moment starts a clock. The subject is to move the telegraph key as soon as he can after hearing the signal. This action stops the clock and the time in thousandths of a second is recorded. This time is called the "reaction time." It has been found that different persons though operating in the same manner with the same apparatus show variations in the reaction-time which are not to be accounted for merely by chance. It was ascertained by Professor Baldwin that there is also an important difference in the length of the subject's reaction time, according to the direction of the attention during the experiment, and he connects this with a difference in types of imagination. In other words, while some persons may react after a signal more swiftly when they pay attention to the signal, others react more quickly when they direct their attention to the motion to be made. In both cases the "direction of the attention" consists of imagination of how the signal sounds or how the action "feels" when it is being done. This difference of imagination has been noticed in other ways. Thus it has been observed that some persons think generally of the appearance of a thing, while others think of its sound—a violin, for instance. The former are called "eye-minded," the latter "ear-minded." But both are of the "sensory" type in contradistinction to the persons whose ideas are always tending to express themselves in *motions* of some sort. Now it is to be supposed that the persons of the "motor" type, as the latter kind are called, would most naturally pay attention to the active or motor side of any experiment, like the reaction-time experiments above mentioned; and that the persons of the so-called sensory



type would most naturally and easily pay attention to the signal, which, whether red light or a touch, is still sensation. And this is what Professor Baldwin has found to be the case, by the experiments carried on during 1898, by him and by others, at the psychological laboratory at Princeton. These experiments are doubly important as a great number of the experiments made by psychologists in past years have been on reaction times and this further knowledge that if the attention vacillates between the signal and the motion made by the subject, the length of the reaction time varies, renders comparatively worthless the many previous experiments in reaction time which have not taken this variation into consideration.

The optical illusion investigated by Professor Baldwin is illustrated in the accompanying figure. He found not only that the mid-point between two square areas is thought to be too far toward the smaller area, but that the illusion is the same if instead of square parallel lines are used.

Contributions to psychological literature during 1898 from the pen of Professor Baldwin have been *Determinate Evolution* (*Psychological Review* Vol. 4); *The Psychology of the Social Organization* (*Ibid.*); *On Selective Thinking* (*Ibid.*); and *Social Forces and Extra-Social Conditions* (*American Journal of Sociology*).

Columbia University.—The laboratory of experimental psychology at Columbia, one of the most extensive in the United States, occupies ten rooms in the Schermerhorn building and has apparatus valued at \$6,000. During 1898, twenty-four lines of research were carried on. Among them are those of Professor J. McK. Cattell, (1) on the time of discrimination as a measure of the psychical amount of difference of sensation, and (2) fatigue as influenced by certain physiological conditions; of Mr. Franz on the production, latent period duration and sequence of colors of the visual after image; of Dr. Thorndike on animal intelligence and the associative processes of animals (see PSYCHOLOGY); and of Dr. Lay on mental imagery. Besides these, there were also of especial interest and importance researches on the relative strength and stability of beliefs, on the emotion of joy, emotional expression in literature and art and the influence of the weather upon accuracy and conduct. In addition to these, the laboratory has, for a number of years, been engaged in making an elaborate series of mental and physical tests upon the Freshmen of the college as they entered, and the Seniors as they left, thus giving an interesting comparison, valuable both for psychology and anthropology, between two similar measurements of the same men, showing their physical and intellectual progress during the four years of their college life.

Professor Cattell has discovered, by a very ingenious series of experiments that sensations, which have hitherto generally been considered to be of too evanescent and variable a character to be accurately measured, may be compared and their difference in intensity or quality measured by the time it takes to discriminate between them. His experiments, a slight variation from the reaction time experiments (described in paragraph Princeton University) are carried out by making a reaction upon a stimulus which consists of a piece of paper, one-half of which is dark and the other light, the colors on different cards used at different times being all shades from white to black. The card is shown by the sliding of a shutter which at the same time starts a clock. The subject sits before the instrument his hands upon two telegraph keys. He is told to move the right hand as quickly as he can after seeing if the lighter side of the card is on the right, and vice versa, the motion of the hand stopping the clock and thus measuring the time to a thousandth of a second. This is, then, an experiment in reaction time complicated with discrimination. The subject must perceive which side is light before he can react. It naturally requires a longer time to discriminate between two shades of gray that are very nearly alike than between a very light and a very dark one. The time of this discrimination is taken on different parts of the scale, there being about 200 shades used, between black and white. If the time of discrimination between two very dark shades of gray be the same as the time of discrimination between two very light shades of gray. (the average of many hundreds of experiments being taken in each case) then the sensations of gray have been compared. The results of these comparisons are numerically measurable, and constitute a statistical estimate which has not, hitherto, been attained. The researches are now being carried on with sensations of sound.

After two years of experimentation upon dogs, cats, chicks and monkeys, Dr. Thorndike concluded that the intelligence of these animals has been overestimated by comparative psychologists (see PSYCHOLOGY). The animals used by him were put into boxes each one so arranged that it could be opened by the animal with some simple mechanism such as a bolt, a wire or a button. When hungry, their efforts to get out of the boxes to the dish of food which was placed within their sight usually resulted in the accidental turning of the button or drawing of the bolt. The association between this action and the release from the box gained thereby made it easier for the animal to get out the second time the experiment was tried upon it. It was thus found what things a dog, cat or other similar domestic animal could

learn and how long it took them to learn it. The memory was surprisingly defective. Dr. Thorndike found that the animals did not learn to get out of his boxes by being allowed to see other animals do it; therefore there are no imagination and free ideas in the mind of the animal.

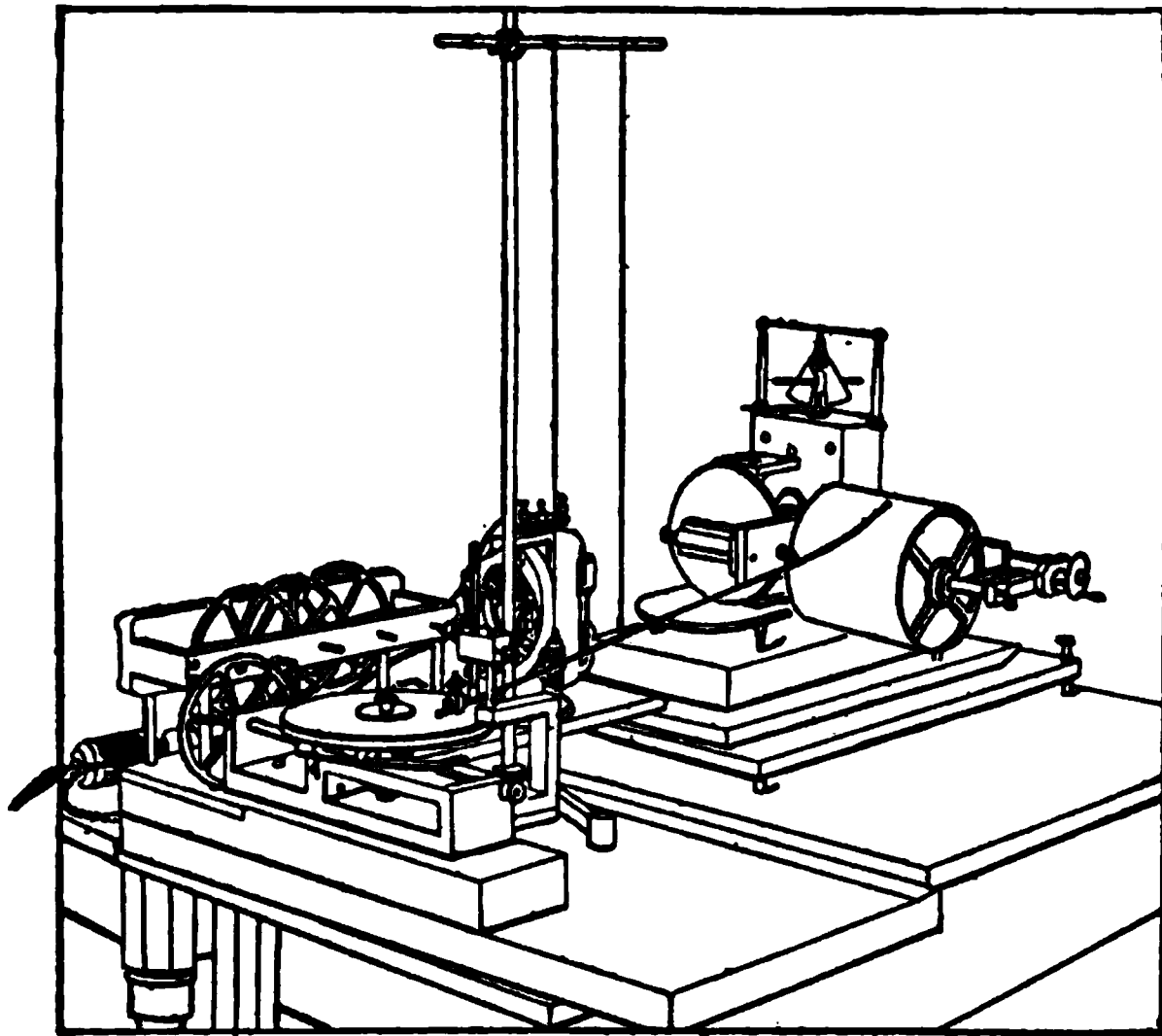
Dr. Lay in his researches upon mental imagery, investigated the sensuous imagination as manifested in over a hundred New York artists and sculptors, and added an

analysis of the sense elements observed in his own train of thought, both connected thought and reverie, together with an examination into certain sense factors in the poems of Shakespeare, Browning, Tennyson, Shelley and Swinburne and the prose of Burke. The results of his experiments upon artists, were to find, in corroboration of certain experiments performed by Francis Galton, that the artists were not remarkable for any extraordinary capacity to imagine the appearances of things, a faculty which it would be most natural to expect in a class of persons who have devoted their lives to the study of the visual aspect of things. The expression of the emotions in literature has been investigated by Mr. Girard, in an ingenious

manner, measuring the length of sentences in different parts of poems or dramas, and observing the proportion of the use of the various parts of speech in relation to the emotional tone of the passage in which they are used. He found that in any piece of literature, the sentences were universally shorter in the emotional climax than anywhere else. A research of much practical interest was made upon the influence of the weather on accuracy and conduct. This investigator has collected nearly 500,000 data of different classes, including, besides those already mentioned, assault and battery, suicide, death, discipline in the penitentiary and asylum for the insane for New York City, with similar reports for the city of Denver, Col. He finds that for the climate of New York there is an excess of all the above classes of data for clear and dry days, as compared with the number for cloudy and wet ones; that excessive heat and low condition of barometer are accompanied by an increase, and that low humidities are also accompanied by slight excesses, while the wind has little effect. For the climate of Denver the effects are quite different, high winds and low humidities having the effect of increasing misdemeanors to an extraordinary degree.

Yale University.—Probably the most important discovery of the year 1898 at Yale was that of the anæsthetic effect of a certain form of electric current (sinusoidal). The generator, run by a motor, was started at a low speed which was gradually increased, alternation becoming more frequent. When the electrodes were applied to the finger, at first there was no sensation, then disagreeableness, then pain; and finally when the frequency of alternations was still further increased, no pain was felt, but only an agreeable numbness while in this condition, and for some time after the removal of the electrodes the finger could be pricked with a pin without any resulting sensation excepting that of dull contact. Sensibility to cold was also temporarily destroyed. Continued experiments were made with a view to introducing this mode of anæsthetizing into surgery, dentistry, etc.

Another section of the laboratory work has been devoted to the experimental study of prose and verse as a form of mental expression. The method employed was

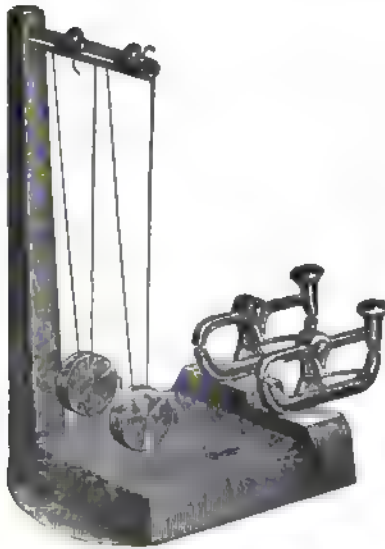


Machine for supplying Gramophone Records.

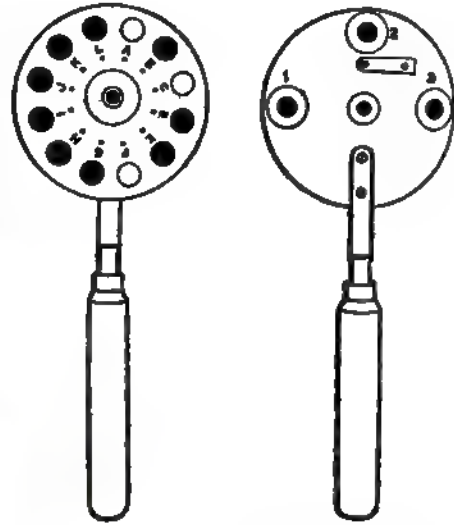
[The gramophone plate on the horizontal disc in front to the left is rotated at an extremely slow speed by gear-work connected to a motor. The grooves in this plate, made by sound-waves, are greatly amplified by the light lever reaching from the plate to the revolving cylinder at the back. The line traced on this cylinder represents the vibrations of the original sound wave in such a way that they can be accurately measured.]

to obtain gramophone plates with the required specimens, to trace them off by a special machine and to measure the resulting curves. Among other results the long-debated question was settled viz.: whether English and German verse are quantitative, i. e., in addition to the element of stress (loud and weak syllables) they contain the element of time (the loud syllables being long and the weak ones short). Both forms of verse were proved to be melodious, that is the syllables fall into a rhythm of high and low tones. It can now be authoritatively asserted that English and German verse forms contain all the elements of the most complicated and perfect verse. This research is part of a system of investigations in the subject of the psychology of expression as shown in gesture, speech, rhythmic activities, such as marching and dancing and in music.

In the early part of the year a Japanese, Matataro Matsumoto, brought to successful conclusion an extensive investigation on acoustic space. The results were presented to the University of Japan, which accepted them as a thesis for the degree of



Prof. Sanford's Vernier Chronoscope.



Color Wheel for detecting color blindness.

Hakushi (Ph. D.). The Yale University department of psychology is peculiar in its popularity among the Japanese and Chinese. Prof. Ladd's *Primer of Psychology* and Dr. Scripture's *New Psychology* have been translated into Japanese. Dr. Scripture's earlier book: *Thinking, Feeling, Doing*, has been translated into Chinese. The laboratory has for the past few years always had a number of students from Japan. The Yale color-sight tester has been introduced into the administration offices of several railroads, for the purpose of testing, more accurately than by the ordinary means, the eyes of engineers, brakemen, and pilots. This instrument detects all who are even partially color blind and is used by the New York Central Railroad and the West of England Railway. The laboratory at Yale possesses, for purposes of demonstration in lecture work, the only lime light triple lantern owned by a psychological laboratory. Its distinctive feature is the projection of three coincident but differently colored pictures upon one screen.

Cornell University.—The laboratory of psychology has been described above. Recently there were twenty investigations in progress and researches had been completed in which the applicability of Weber's law to the sense of smell had been tested; the cutaneous perception of form and the distraction of attention by musical sounds had been studied. Other researches worthy of especial mention were on *Individual Psychology* and *A Study in the Mechanics of Visual Memory*. The director of the laboratory, Professor E. B. Titchener, published in 1898 his book *A Primer of Psychology*. The Cornell laboratory has a large annual appropriation for psychological apparatus and in 1898 added many important new instruments to the already complete outfit.

The University of California.—The laboratory of experimental psychology was founded in 1898 and occupies ten rooms in a building constructed with especial reference to its needs. The rooms are connected with an exceptionally complete elec-

trical system. The apparatus includes the more important standard psychological instruments both for demonstration and for advanced research. Investigations of importance made during 1898 at the University of California were: 1. The limits within which binocular perspective is still evident. The experiments showed that the true binocular or stereoscopic effect extends to at least 580 meters from the observer, as against the 240 meter estimate of Helmholtz, and that the stereoscopic effect is produced by absolutely unnoticeable disparity in the two ocular fields—a difference as small as 24" of arc. 2. Experiments on the basis of the harmony of visual and tactual localization, showing that touch and sight tend to a spatial harmony, not only in spite of a variation in the apparent direction of all visual objects, but in spite of a combined variation of the apparent distance and direction of visual objects.

Clark University.—The psychological laboratory at this university, under the direction of Professor E. C. Sanford, carried on during 1898 researches on rhythm; in inhibition as exhibited in the quickness with which different subjects could acquire the habit of not winking when a sudden movement was made before their eyes; experiments upon the rapidity of writing certain outlines of shorthand; a study of the power to discriminate the time of sensation of two senses, the time for instance, between a click and a flash of light, this problem bearing upon the sense of time much disputed by psychologists; an extended study of the effects of alcohol upon the muscular activities and upon the intellectual processes and another upon the effect of a short period of very rapid breathing on the mental and physical condition of the subject. Probably of most interest to the general reader are the results of a long series of researches in the field of the psychology of reading (see following paragraph). Another research of much general interest, considering its bearing upon the effect of mind on body brought into such prominence by various schools of psycho-therapeutics (see HYPNOTISM) was that concerning the effect of close attention, given to the hand or other member, upon the local circulation of blood and upon the rate of heart beat.

The laboratory received an addition to its apparatus in the shape of an electromagnetic regulator which has been adapted to a heavy set of clockwork for the purposes of greater exactness in speed. In 1898 Professor Sanford made public a new chronoscope called the vernier chronoscope, which he adapted from the invention of a German astronomer.

Psychology of Reading.—In 1898, J. O. Quantz had ascertained that the various types of imagination (see Princeton University) exercised an important influence upon the rapidity of reading. In other words, eye-minded persons read more rapidly than ear-minded persons, who imagine that they hear the words as they read them, or motor-minded persons who slightly move their lips as they read; that much reading tended to reduce this lip motion; that rapid readers remember what they read better than slow ones, retaining more of the original thoughts, and the character of their reproduction is much higher, and that the eye in the case of the rapid reader is a greater distance ahead of the voice when reading. While the foregoing work referred mainly to the factors which affect the rate of reading and the amount of information obtained, other workers have studied the motions of the eye in reading. This can be successfully done only by attaching something directly to the eyeball itself. Two investigators, one at Clark University and one at Brown University, fitted a plaster of Paris cap on the eye, made insensible to pain by cocaine, and to this fixed a thread or wire going to a pen which traced the motion thus imparted to it, on the revolving drum of a kymograph. By this means every slightest motion of the eye is recorded upon paper. The fact that, in reading, the motion of the eye from side to side of the page is a source of fatigue makes important the conclusion of Mr. Huey at Clark University that one could read faster if words were printed in narrow columns. It was found that all words of eleven letters or more could be read more rapidly if they were printed one above the other in a vertical column, and that if the column could be as narrow as $\frac{7}{8}$ inch it would make unnecessary any lateral motion of the eyes; and, as the eye naturally moves in an up and down direction more easily than from side to side, it would make easier reading if books and periodicals were so printed. It was also found that the first half of every word is the part by which the eye recognizes the words as it glides along from line to line.

University of Iowa.—The laboratory of experimental psychology was founded in 1894 with apparatus which has cost \$2,200. *The Universities of Iowa Studies in Psychology* is issued biennially. Three important researches were completed during 1898. 1. On automatic writing as a feature of the secondary personality. 2. On the confusion of tastes and odors. 3. Studies in the illusion of weight.

Particularly interesting in view of their bearing upon the present methods employed in the seances of trance mediums as described under the head of Spiritualism (q. v.) were the researches carried out in 1898 by Professor G. T. W. Patrick of the State University of Iowa, on the subject of automatic writing. He found a young person (Henry W.) who was easily trained to write automatically. He was seated

with his right side toward a table, his right hand on a large sheet of brown paper, holding a lead pencil. When his head was turned away toward the left and his attention taken up in reading a book or in conversation with anyone, his hand would without his knowledge write answers to the spoken questions of Professor Patrick. The words written by the subject's hand seemed to manifest all the marks of being the utterances of a personality other than that of Henry W. and calling itself Bart Laton. A large number of answers were received to questions, in the first place relating to the character, mental and moral, of the supposed secondary personality, his past history, mental and emotional peculiarities, etc.; a second set of questions framed to test the claims of the secondary personality to supernormal knowledge; and a third relating to telepathic power and any remarkable, though normal, mental ability, neither of which was found. The automatic hand was asked to tell what Henry W. had eaten at all his meals for several weeks back, to multiply 9×16 and other more difficult arithmetical problems, to give the dates of notable historical events, to name certain streets in order, and many other questions—the answers being almost uniformly wrong. Professor Patrick in these experiments gave the secondary personality, Laton, every possible chance to prove himself to be, as he said he was, the disembodied spirit of a deceased person, and concludes that he failed in every way. Henry W. was afterward hypnotized and manifested the same secondary personality, while in the hypnotic condition. These experiments are considered to be a strong argument against the spirit hypothesis called in by Dr. Hodgson to explain the trance utterances of Mrs. Piper. See SPIRITUALISM.

During 1898 Prof. Patrick performed some interesting experiments upon the senses of smell and taste. He found one subject, a woman, who was completely anosmic or without the sense of smell. After testing her with about a hundred odorous substances, and thus ascertaining that she was unable to smell anything at all, he found that the sense of touch, upon the tongue, and the sense of taste were not wanting. He then tested the anosmic subject simultaneously with several normal persons to determine the part played by the senses of smell, touch, temperature and sight in so-called taste sensations, as given in ordinary foods and drinks. These experiments extended over ten weeks and included over 185 different substances. About half a teaspoonful of each substance was given to each subject, who was allowed to smell it, taste it and finally to swallow it. The substances were divided according to the results into three classes: The first were those recognized both by the anosmic and by the normal subjects, presumably those recognized by the sense of taste alone; but more probably recognized by the senses of touch and temperature. The second class included those substances recognized by the blind-folded normal subjects but not by the anosmic. These were as follows: coffee, tea, normal alcohol, port wine, claret, vinegar, spirits of almond, tincture of rhubarb, vanilla extract, absolute alcohol, tincture of ginger, chocolate cocoa, milk, sour milk, nearly all the common fruits, boiled turnip, raw and boiled onion, yolk and white of egg, oil of rose, and kerosene. A third list of substances included those recognized by one of the normal subjects, but not by the other nor by the anosmic. A fourth list included the substances recognized by none of the blind-folded subjects. Among other conclusions the following was drawn: What commonly passes for taste sensations, so far as their discriminative or intellectual value is concerned, is the composite result of the mingling of sensations of smell, touch, temperature, sight and taste, the last, however, playing little or no part in the discrimination of our common foods and drinks. Taste sensations proper furnish rather the emotional element in the total conscious effect. Sweet things are called "good" and bitter things "bad," while salt and sour add a certain piquancy which is pleasing when not excessive.

Brown University.—The laboratory of psychology under the direction of Prof. E. B. Delabarre received notable additions to apparatus for demonstration and research; and the investigations were made in the subjects of tremors of the hand and some influences affecting them; the influence of eye-strain upon one's judgment of extent of space; and on some individual differences in the force and rapidity of reaction movements.

Prof. Delabarre during 1898 made upon himself, some valuable experiments of the effect of *cannabis Indica* (hashish) upon the mind and nervous system. He took from $\frac{1}{2}$ to $1\frac{1}{2}$ grains of the solid extract as a dose. He found the effects very variable, during the period of five to nine hours while the effect lasted. In the first half of this time he noticed increased keenness of sensations, delicacy of discrimination and rapidity of mental association, testing himself for these with the instruments of the psychological laboratory. In addition to these he observed a richness of imagery and thought and increase of the rate of pulse and breathing; and at the same time a decrease in muscular strength and steadiness and in secretions. In the second half of the period during which he was under the influence of the drug, he observed a gradual return toward normal powers. He concludes that the mental state is one showing an exaggeration of the normal states, and is thus exceedingly valuable as subject for psychological analysis.

Wellesley College.—The well-appointed laboratory of psychology at Wellesley received in 1898 an important addition in the shape of an improved fluid-mantle olfactometer, the second of its kind to be imported to America, the invention of Dr. H. Zwaardemaker, of Utrecht, Holland. With this it is proposed to test the sensibility to smell of the students of the college in order to make a more scientifically accurate comparison between women and men in this respect. Other researches carried on at Wellesley during the year 1898 include one on the physiological reactions to emotional stimuli. This experiment was performed upon thirty women, students and teachers in the college. Pictures, printed pages and sums in arithmetic were given to the subjects and the change in respiration was noted—in every case an increase in the rate of respiration during the time when the picture, page or sum was given to the subject.

PTERIDOPHYTA. See BOTANY.

PUBLIC HEALTH ASSOCIATION, AMERICAN, organized in 1872. Last annual meeting was held at Ottawa, Canada, in September, 1898. President, C. A. Lindsley, M. D., New Haven, Conn.; Secretary, Henry D. Holton, M. D., Brattleboro, Vt.

PUBLIC HEALTH AND VITAL STATISTICS. In 1898 the Board of Health for the State of New York published its report for the year ending November, 1896. In that year 124,630 deaths occurred in an estimated population of 6,750,000, the death rate being 18.50 per thousand, or one death to every 54.20. According to the average death rate of the Massachusetts standard table for forty-six years, of 19.98 per thousand, there were 13,000 deaths less than might have been expected. The implied longevity, according to the death rate for the year, was 54.15 years. The average daily rate of death was 330. There were 40,530 deaths of persons aged under five years; or a percentage of 33.5 to the total deaths. There were 160 deaths from zymotic diseases per thousand total deaths. There were 513 deaths from cerebro-spinal meningitis; 1,585 from typhoid fever; 453 from malarial diseases; 3 from small-pox; 71 from scarlet fever; 1,617 from measles; 354 from erysipelas; 1,000 from whooping cough; 4,640 from croup and diphtheria; 8,764 from diarrhoeal diseases; 17,106 from acute diseases of the respiratory organs; 13,257 from pulmonary tuberculosis; 985 from puerperal diseases; 8,947 from diseases of digestive system (not diarrhoeal); 7,706 from diseases of the urinary system; 10,518 from diseases of the circulatory system; 11,864 from diseases of the nervous system; 3,765 from cancer; 7,037 from accidents and violence; 5,333 from old age; 14,820 unclassified. The largest monthly number of deaths, 12,659, occurred in July; the smallest monthly number, 7,888, occurred in November, the constant rule in the State. The seventh annual recurrence of epidemic influenza (La Grippe) began in December, 1895, and lasted through April. It was at its height in March. The total number of estimated deaths from this cause was 2,750, distributed as follows; December, 250; January, 500; February, 500; March, 1,100; April, 400. The greatest number of deaths from typhoid fever was in September and October, the totals for the four seasons being as follows: winter, 448; spring, 249; summer, 340; autumn, 548. The ratio of deaths from typhoid fever was 13 per 1,000. Diphtheria prevailed most widely in November, December and January, the distribution among the seasons being as follows: winter, 1,537; spring, 1,107; summer, 912; autumn, 1,084. The ratio per thousand was 38.35. There were 13,257 deaths from pulmonary tuberculosis, or a little more than 10 per cent. of the total number of deaths. Scarlet fever caused the smallest mortality in ten years, 771, distributed as follows: winter, 203; spring, 235; summer, 124; autumn, 109.

The latest report in circulation of the State Board of Health of Pennsylvania is that for the year ending December 31, 1895. The total number of deaths in a population of 2,512,512 is not stated. There were during the year 963 deaths from diphtheria and croup; 462 from scarlet fever; 1,391 from typhoid fever; 45 from small-pox; number from tuberculosis not stated.

The Public Health Reports of the United States Marine Hospital Service, issued weekly by the Treasury Department, contain the information collected by United States Consuls and others. The figures given are only approximately correct, especially as regards the foreign mortality tables. Inconsistencies occur in reports obtained on different occasions regarding the progress of disease at a given time; and in some cases no figures are stated at all, the note "impossible to obtain statistics" being frequently made. The following figures are compiled from the tables of foreign mortality reported between January 1 and December 31, 1898, in the case of four diseases:

Cholera.—China 5 cases, 3 deaths; India 1,269 deaths; Japan 89 cases, 46 deaths; Straits Settlements, 1 death.

Yellow Fever.—Brazil 1,481 cases, 1,654 deaths; Colombia 7 cases, 14 deaths; Costa Rica 7 deaths; Cuba 19 cases, 201 deaths; Jamaica 9 cases, 7 deaths; Mexico 66 cases,

345 deaths; Santa Domingo, 35 cases, 9 deaths; San Salvador, 38 cases, 8 deaths; West Indies, 10 cases; 1 death; Yucatan, not stated. There were no reports from Cuba during the continuance of the hostilities between the United States and Spain. Previous to these hostilities it was reported that yellow fever was prevailing at Sagua la Grande, Cuba; no figures being ascertainable. There are many inconsistencies in the reports of the deaths from yellow fever at Rio de Janeiro, Brazil.

Bubonic Plague.—Arabia, 2 cases, 35 deaths. Austria, 3 deaths. China, figures impossible to obtain; at Amoy, on June 11, one hundred deaths a day were reported; in Canton, 10 cases, no deaths stated; in Hong Kong, 1,331 cases, 1,284 deaths; in Swatow, one hundred deaths a day in June. Egypt, 1 case. India, 17,394 deaths. Japan, 2,848 cases, 1,571 deaths. Russia 2 deaths. Turkestan, 233 deaths.

Small-Pox—Africa, 3 cases, 28 deaths. Cape Colony reported as epidemic at Natal and Pretoria. Australia, one death. Belgium, 44 cases, 37 deaths. Bohemia, 107 deaths. Brazil, 592 cases, 128 deaths, these figures exclusive of the cases at Bahia and in interior districts, where the epidemic was severe. British Columbia, 10 cases. Canada, 13 cases. China, 214 cases, 131 deaths. Cuba, 1,205 cases, 348 deaths, exclusive of those occurring during the war between the United States and Spain. Ecuador, 2 deaths. England, 156 cases, 13 deaths. France, 5 deaths. Germany, 5 cases. Gibraltar, 9 cases. Honduras, 2 cases. India, 213 deaths. Italy, 12 deaths. Japan, 1,591 cases, 373 deaths. Mexico, 4 cases. Norway, 34 cases, 4 deaths. Nova Scotia, 3 cases. Netherlands, 5 cases, 1 death. Russia, 487 cases, 478 deaths. Scotland, 7 cases, 1 death. Spain, 6 deaths. Straits Settlements, 3 deaths. Turkey, 240 deaths. Uruguay, 12 cases, 1 death. Venezuela, 77 cases, 6 deaths are tabulated, while it is further reported on July 23, that there were then about 1,000 cases. Wales, to August 21, 2,000 cases, 600 deaths.

No quotations are made from the mortality tables of the cities and towns of the United States, as they are noticeably incomplete and defective.

The reports of the prevalence of small-pox in the United States yield the following summary: Alabama, 1,259 cases, 14 deaths. Arizona, 1 case, recovered. Arkansas, 133 cases, 2 deaths. California, 1 case, recovered. Colorado, 40 cases, 2 deaths. District of Columbia, 11 cases, recovered. Florida, 17 cases, recovered. Georgia, 601 cases, 10 deaths (partly estimated). Illinois, 2 cases, recovered (none in Chicago). Indiana, 2 cases, recovered. Iowa, 4 cases, recovered. Kansas, 13 cases, 1 death. Kentucky, 186 cases, 2 deaths (incomplete). Louisiana, 5 cases, recovered. Massachusetts, 2 cases, recovered (none in Boston). Michigan, 9 cases, 1 death. Mississippi, 101 cases (incomplete). Missouri, none. New Jersey, 1 case, recovered. New Mexico, 525 cases, 169 deaths (incomplete). New York, 12 cases, recovered (2 in New York City). North Carolina, 64 cases, recovered. Ohio, 117 cases, 1 death (Cleveland, one; Columbus, one; Cincinnati, four cases). Oklahoma, 5 cases, 1 death. Pennsylvania, 65 cases, 2 deaths (incomplete; Philadelphia, no cases). South Carolina, 136 cases, recovered (incomplete). Tennessee, 157 cases, recovered. Texas, 36 cases, 8 deaths (incomplete). Virginia, 115 cases, 1 death (incomplete; Richmond, no case). West Virginia, 31 cases, recovered. Wisconsin, 3 cases, recovered.

The extent of yellow fever in the United States is shown in the following summary, the cases all occurring between July 1 and December 8: District of Columbia, 1 fatal case. Louisiana, 1,470 cases, 41 deaths. Mississippi, 985 cases, 63 deaths. New York, 1 fatal case. Ohio, 1 fatal case.

The first cold weather in Havana, Cuba, when the mercury reached 60° F., occurred December 5. The sanitary condition of Havana under the present favorable circumstances is seen in the following reports:

Deaths from	Week Ending Dec. 8, 1898.	Week Ending Dec. 15, 1898.
Yellow fever	1	2
Enteric fever	42	29
Pernicious fever	23	13
Malarial fever	58	41
Grippe	0	3
Diphtheria	1	0
Starvation	0	3
Dysentery	34	15
Enteritis	68	60
Pneumonia	4	9
Tuberculosis	55	44
Total deaths	416	409
Annual ratio per 1,000	108.16	106.34

Cienfuegos, Cuba, with a population of 21,589, suffered from the following mortality, between Jan. 1 and Nov. 19, 1898: yellow fever, 3; enteritis, 734; fever (paludismo), 577; pernicious fever, 264; pneumonia, 17; tuberculosis, 298; smallpox,

102; dysentery, 415; beriberi, 0; typhoid fever, 80; other causes, 1,136. Total, 3,626 deaths.

In March appeared the annual report of Dr. L. J. H. Roy, for 1896, of the Province of Quebec. The birth-rate for that year was 38.57 per 1,000, and the death-rate, 20.05; or, omitting still-births, 18.58 per 1,000. Thus the births doubled the deaths. The 35 counties in Quebec, which have an almost exclusively French population, show the following figures:

Population	658,756
Births (1896).....	28,615
Deaths (1896).....	13,977
Birth-rate	43.43
Death-rate	21.21
Surplus of births over deaths per 1,000, 22.22.	

In France the deaths annually exceed the births at such a rate that the population of France is dwindling at the rate of 0.4 per 1,000 annually.

PUERTO RICO, or PORTO RICO, an island in the West Indies, acquired by the United States as a result of the Spanish-American War in 1898, has an area of about 3,668 sq. m. with a population estimated at from 806,000 to 900,000, the latter being the more recent figure. Its capital is San Juan with a population estimated in 1896 at 30,000. A mountain range traverses the island from east to west. The country is well-wooded and abundantly watered. The soil is very fertile, the chief occupations being agriculture and lumbering. The principal crops are sugar, coffee, tobacco, cotton and maize and among fruits, of which there is a great variety, bananas and pineapples are raised in abundance. The mineral resources include gold, carbonates, sulphites of copper, magnetic oxide of iron, lignite, yellow amber, marble, limestone and other building stones; but the chief mineral industry is the preparation of salt. The chief imports are, in the order of their importance, rice, fish, meat, lard, flour, manufactured tobacco, olive oil, cheese, wine, soap, iron, vegetables and other provisions, and jerked beef, and the chief exports are coffee, sugar, tobacco and honey. This list, however, is based on the statistics for the year 1895, which were the latest available figures in 1898, showing the total trade of the island. The trade with Spain has been larger than with any other country. In 1896 the imports from Spain amounted to \$7,328,880, and the exports to Spain, \$5,423,760. In that same year the imports from the United States to Puerto Rico amounted to \$2,102,094, and the exports to the United States to \$2,296,653. In 1896 the trade with the United States showed a slight falling off, the imports to Puerto Rico being \$1,988,888, and the exports from Puerto Rico \$2,181,024. The chief imports from the United States in that year were, petroleum, iron ware, dried and salted meats, textiles and dairy products, while rice was the article most largely imported from other countries.

The chief article of export from Puerto Rico is coffee, and the next in importance is sugar. The other principal exports are cattle, molasses, tobacco, hides and timber. There are 137 miles of railway open for traffic and 170 miles under construction. There are 470 miles of telegraph.

Cities.—The principal city is San Juan, situated on an island off the northern coast with which it is connected by a bridge over the intervening arm of the sea. The chief fortification is Morro Castle on a bluff at the end of the island commanding the entrance to the harbor. The harbor is the best in Puerto Rico. The walls which surround the city, though built 250 years ago, are still in good condition. The city is regularly laid out in squares, and the houses, which are usually two stories high, are compactly built. Before the American occupation, the conditions of the town were most unsanitary owing to the carelessness of the inhabitants and to the fact that there was no running water or sewerage system in the city. Epidemics were said to be frequent, and the houses infested with vermin. It was expected that great benefits would result from the introduction of American sanitary improvements, for with a proper sewerage system it seemed easy to secure effective drainage, the soil under the city being hard and the sea water flowing rapidly in and out of the harbor. Within the city walls the population was estimated at 20,000, and including the suburbs, at 30,000 (1896), about one-half of whom consisted of negroes and mixed races. The industries of the city are not important, the manufactures including matches, brooms, and soap. Ponce is next to San Juan in importance, having a population of about 15,000. It is the chief city of the department of the same name, which has a population of about 40,000. The chief pursuits of the inhabitants are mercantile. It is connected by a good road with its port, Playa, which has about 5,000 inhabitants. The third city in importance is Mayaguez, which carries on a considerable export trade, including sugar, coffee, oranges, pineapples and cocoanuts. It is connected by tramway with Aguadilla.

History.—For an account of the military campaign in Puerto Rico in 1898, see the article **SPANISH-AMERICAN WAR**. The commissioners appointed by the United

States to arrange evacuation notified the Spanish commissioners that the withdrawal of the Spanish troops must take place on or before October 18. On that date some 1,600 Spanish troops, for whom transportation had not been provided, were removed from San Juan to the suburbs and the American flag was raised over the public buildings. The Military-Governor, Major General John R. Brooke, assumed control of the island and took up his residence in the captain-general's palace. Brigadier-General Henry assumed command in the district of Ponce, and Brigadier-General Grant in that of San Juan. The members of the old cabinet of the island having taken the oath of allegiance to the United States continued in office. There was a strong feeling among a large element of the population that the military government should cease at once and that the island should form a territory of the United States under a civil government. A mass meeting was held on October 30 and these views were expressed. Toward the close of the year the factional divisions of the people offered an obstacle to the governments. Early in December Gen. John R. Brooke departed from Puerto Rico to assume his new duties as Military-Governor of Cuba, and his place was taken by General Guy V. Henry, who immediately outlined the policy of his administration. According to his programme the local councils and alcaldes in the various towns were to have independence of action. They were required to enforce police and sanitary regulations and do all in their power to improve the condition of the towns. As to the question of suffrage, the policy of the new Governor was not explicitly stated. The difficulty was that an educational test would throw the power into the hands of about 14 per cent. of the people, while universal manhood suffrage would give it to uneducated masses. The Governor said that men in office would not be removed except for cause. He urged that the system of school education be examined and that teachers be employed to give instruction in the English language. As to judicial affairs he stated that inquiry should be made into the charges upon which those in jail were retained there and that in case of a failure on the part of the civil courts to perform their duties, commissions had been organized to try the accused. Incendiary publications in the newspapers were prohibited. The Governor also gave orders that delegates should be summoned to a convention at San Juan to be held on or before December 19. See also UNITED STATES (paragraphs on History).

PUGH, EDWIN WILLIAM, author, born in London, Jan. 22, 1874. His story of a Cockney boy, *Tony Drum*, attracted attention in 1898. He has also published *A Street in Suburbia* (1895); *The Man of Straw* (1897); and *King Circumstance* (1898).

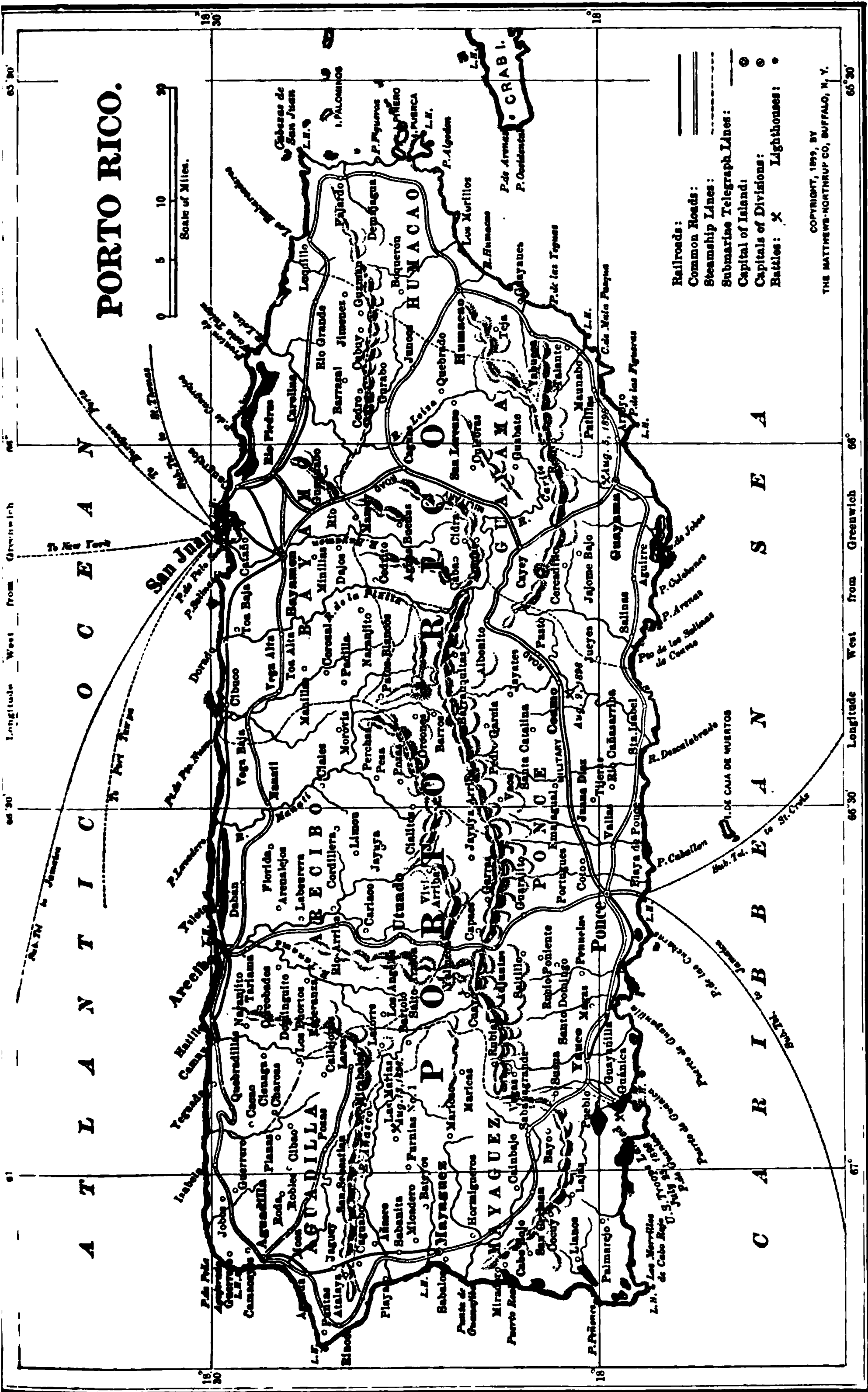
PULLMAN. On October 24, 1898, the Supreme Court of Illinois rendered a decision against the Pullman Palace Car Company, declaring that the company was exceeding its charter rights in conducting its business. Three years before Attorney-General Maloney brought an action against the company, charging that it was loaning money, dealing in real estate, and conducting municipal enterprises in violation of its charter. The suit came before the Circuit Court and was thrown out; a demurrer being entered by the State, the case was taken on appeal before the Supreme Court, with the above result; and the case was remanded to the Circuit Court of Cook county for trial. The substance of the findings of the court were as follows: "The court holds that the charter of the company did not clothe it with power to purchase the real estate upon which the town or city of Pullman is built, or to construct the buildings in said town or city, or to engage in the business of renting dwellings, storerooms, market places, etc.

"It holds that it may not own stock in the Pullman Iron and Steel Company, but that it may sell liquors to the passengers on its cars.

"It may properly own the Pullman Building in Michigan Avenue (Chicago), in which the general offices are located.

"It may properly own twenty-five acres of land near the Belt Line Road for the reception of its cars, and it may properly furnish power to the Allen Paper Wheel Company."

The court also declared against the assumption by the company of municipal powers in the town of Pullman. This town, situated in the thirty-fourth ward of Chicago, but having no governmental connection with it, was built and its government was administered by the Pullman Car Company for the convenience of its employees: it numbers about 12,000 inhabitants, half of whom are employed by the company. Mr. John S. Runnells, general counsel for the Pullman Company, said that the company had always believed itself legally justified in all its actions. Mr. Runnells added: "The company's defense was two-fold. First, that the liberal special legislative charter of the company gave it the right to hold such real estate as the board of directors might deem necessary; and, second, that the time for the State to object was when the town was built, not fourteen years afterward. I presume that the Circuit Court will give the company a reasonable amount of time in which to comply with the law as construed by the Supreme Court. The company will not attempt to disobey the order of the court."



PORTO RICO.

Scale of Miles.
0 5 10 20

- Railroads:
Common Roads:
Steamship Lines:
Submarine Telegraph Lines:
Capital of Island:
Capitals of Divisions:
Battles: X Lighthouses: •

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65° 30'

PUTNAM, MARY LOWELL, the sister of James Russell Lowell, died in May, 1898. She was the author of *The Records of an Obscure Man* and two dramatic poems, *The Tragedy of Error* and *The Tragedy of Success*.

PUMICE. This mineral was produced commercially in the United States for the first time in 1897. The supply came from two beds of volcanic ash in western Nebraska, and one in Utah, and the amount shipped up to May, 1898, aggregated 600 tons. Heretofore nearly the entire demand for pumice has been supplied by the Island of Lipari, north of Sicily. The value of pumice imported for the 12 months ending June 30, 1897, was \$65,930.

PUMPING ENGINES. See SEWAGE and WATER-WORKS.

PUVIS DE CHAVANNES, PIERRE CECILE, the French decorative painter, died on October 25, 1898. He was of an old family whose history reaches back to 1152. He was born December 14, 1824, and he did not achieve fame as a great artist until comparatively late in life. After his graduation from the Lycée Henry IV in Paris, he passed two years in art study in Italy and then entered the studio of Henri Sheffer and later that of Thomas Couture. He is said not to have been a diligent student, and to have finally found that he could progress best by studying in his own *atelier*. During each of the eight years from 1852 to 1860 he exhibited a picture in the Salon, but they were all rejected. His companion decorations entitled "War" and "Peace," which he exhibited in 1861, were the first of his works to bring him real distinction as an artist. Although they were severely criticised by some, they were awarded a second class medal and were placed in the museum of Amiens. It is interesting to know that the government purchased "Peace" for \$1,200, and since it refused to buy the companion picture received it as a gift of the artist, who could not suffer the two to be separated. Like the rest of his decorative work, they were painted on canvas with a medium of wax, being cemented to the wall with white lead. The amount of work accomplished by Puvis was enormous. The greater number of the pictures finished in the years immediately succeeding 1861 were also placed in Amiens. In 1863 appeared "Work" and "Rest," in 1865 "Ave Picardia Nutrix," and in the next year "Vigilance" and "Fancy." At the exhibition of 1867 appeared his reductions of "Peace," "War," "Work," and "Rest," together with a new picture entitled "Sleep." Being awarded another third class medal, and receiving the red ribbon of the Legion of Honor, he was thereafter constantly called upon to serve with judges on questions of art and upon art commissions. In 1868 he exhibited "Play," the next year "Massilia, Greek Colony" and "Marseilles, Gate of the East"; in 1870 appeared the "Beheading of John the Baptist" and "Magdalen in the Desert," in 1872 "Hope," in 1873 "Summer," in 1874 "Charles Martel's Victory Over the Saracens"; the latter was placed in the Hotel de Ville of Poitiers. In 1875 appeared "St. Radegonde Protecting Education" and a "Fisherman's Family. During the years 1876 and 1877 he was at work on the famous decorations for the Panthéon in which were portrayed the infancy of St. Geneviève, and for the merits of which he became an officer in the Legion of Honor. The "Prodigal Son" and "Girls by the Seashore" appeared in 1879, and in the following year he did the "Ludus pro Patria," which was placed among the decorations at Amiens. The "Poor Fisherman," which is now in the Luxembourg, and is an easel-picture, was painted in 1881, and in the next year appeared "Doux Pays," for which he received the medal of honor; in 1883 he exhibited the "Dream," "A Woman at Her Toilet" and a "Portrait of Mlle. M. C." He began in 1884 the beautiful decorations for the museums in Lyons; in the two years following appeared several of his most excellent pictures, and in 1889 he was occupied with what has been called his finest work, the decorations of the Sorbonne; upon the completion of this work he was made commander of the Legion. Puvis de Chavannes was one of those who brought about the movement in 1890 which called forth the Société Nationale des Beaux-Arts, and at the death of Meissonier in the following year, he was made president. At this Salon of the new Société he exhibited in 1891, together with several small pictures, "Inter Artes et Naturam." These, with "Winter," which appeared in 1892, were placed in the Hotel de Ville of Paris. Among his last works may be mentioned the great panel which is now at the head of the main stairway in the Boston Public Library.

It is difficult to attempt to say what will be the final position in the realm of art of Puvis de Chavannes. He was an old man when he died and we have doubtless witnessed the full capability of his genius. He had attained the highest honors and was recognized as one of the greatest painters of his day, and yet there are critics who say that his work was defective in drawing, in light and shade, and even in color. His admirers, on the other hand, maintain that his drawing was perfect after his own style, and that he was a master of color. It is doubtful if the latter statement can be refuted. It is not fair to judge his paintings apart from the setting in which he intended them to be placed, for whatever may be said against the artist, he was a master of harmony, and there is always a fine concord between the indi-

vidual pictures in a series painted by him, and between this series and its architectural surroundings. Without guessing as to his final position as an artist, we can only say that at his death the critics had ceased to regard him as a laughing stock as they had done in his earlier years, but recognized that while he might be deficient in some details of technique, he was nevertheless, a great artist possessed of real originality. So original was he that it would doubtless be unwise to follow him as a master, and yet he has a message for every lover of art; it has been well said that "to copy his methods would be to learn ill the lesson he taught."

QUAIN, Sir RICHARD, an eminent English physician, died March 13, 1898. He was born October 13, 1816; educated at University College, London; he received his degree of M. D. from London; several honorary M. D.'s were conferred upon him and an honorary LL. D. from Edinburgh. He was a Fellow of many learned societies, connecting physician to several hospitals, president of the General Medical Council (1891), and physician extraordinary to the Queen. He published various medical works and edited *The Dictionary of Medicine*. He was created a baronet in 1891.

QUAKERS. See FRIENDS.

QUEBEC, a province of the Dominion of Canada, has an area of 228,900 sq. m. Capital, Quebec.

Unoccupied Lands.—In view of the fact that the province has a vast amount of unproductive capital, it has been proposed that the government dispose by sale of the land, minerals, and forests of the whole of the unoccupied northern portion of the province, extending to Hudson bay and the East Main river. The value of this tract has been estimated at \$50,000,000, and the proposition is to sell for this sum, and of the proceeds use one-half to pay off the funded and floating debts of the province and the other half to promote industrial and commercial development.

Mineralogy.—Large deposits of chromic iron ore have been found in Coleraine, which averages over 50 per cent. of metal, is easily mined, and finds a ready market in the United States. There are also large and valuable deposits of magnetic ore. Beauce county has a bed of granular ore, about two-thirds magnetic, with a vein 45 feet wide, and near Hull is a mass of specular ore, assaying over 60 per cent. of metallic iron. The total production of ore in 1896 was 17,630 pounds. Gold mining yielded \$900, a decline in a year from \$3,000. Copper and petroleum exist in apparently paying quantities. The province is very rich in mineral lands, but so far scarcely anything has been done to develop them.

Fisheries.—The value of the total yield in 1896 was \$2,025,754; value of apparatus used \$799,737; principal catches, cod, \$854,486; herring, \$240,831; salmon, 212,555; and lobsters, \$162,535; value of exports of fishery products (1897), \$515,427.

Commerce.—The imports of merchandise in the year ending June 30, 1897, amounted in value to \$53,051,890; duties collected, \$7,846,075; exports, \$60,275,136. The registered shipping of all kinds numbered 1,791, of 212,136 tons, and vessels, British and foreign, engaged in the coasting trade which arrived at and departed from provincial ports, had a total tonnage of 5,354,449. Navigation was facilitated by 117 light stations and eight lightships, with a total of 163 lights.

Banks.—The largest banking institutions in the Dominion have their headquarters in Montreal. The exchanges at the clearing house there in 1897 aggregated \$601,181,000, an increase of \$73,323,984 in a year. There was a total of 137 post-office savings banks in the province, with 19,475 depositors and \$5,422,629 deposits.

Railways, Telegraphs, etc.—On June 30, 1897, the total length of all steam railways was 3,232 miles, the construction of which had been aided by the government with \$16,672,870 and by municipalities with \$4,359,074. The bonus of the Dominion government was increased by \$540,907 in 1897. There is an annual payment by the Dominion government to the provincial government of \$119,700, being five per cent. on the grant of \$2,394,000 for the line between Ottawa and Quebec, and the total amount thus paid up to June 30, 1897, was 1,496,250. Land lines of telegraph had a total length of about 930 miles, and the length of cable lines was reported at 165 knots. There were 1,664 post-offices, which handled 26,850,000 letters and 4,750,000 postal cards, and 225 money-order offices, which issued 127,095 orders.

Education.—Educational matters are under the control of a superintendent of public instruction, assisted by a council of 35 members, divided into committees for the management of the Roman Catholic and Protestant schools respectively. The schools are maintained partly by local taxation and partly by government grants, and are individually controlled by local boards and by the local clergy. In 1897 the Roman Catholic schools numbered 4,846, comprising 4,208 elementary, 475 model, 138 academies, 2 normal, 18 classical colleges, 2 universities, and 3 schools for deaf mutes and the blind, and having a total enrollment of 267,012 pupils and students and an average attendance of 200,801. The Protestant schools numbered 990, comprising 907 elementary, 49 model, 27 academies, one normal, 3 colleges affiliated to universities, 2 universities, and a school for deaf mutes, and having a total en-

rollment of 39,155 pupils and students and an average attendance of 27,640. Besides these there were seven schools of arts and manufactures, with 1,038 students, and five schools of agriculture, with 356 students. There were in all 5,761 school houses and 10,433 teachers. The expenditures of the school year were \$1,701,136, of which \$304,410 was from the government grant and \$1,396,726 from local taxation. Public libraries numbered 39, with a total of 531,356 volumes, and periodicals (1898), 119, of which 15 were dailies, 70 weeklies, and 22 monthlies.

Government.—Public affairs are administered by a lieutenant-governor, an executive council of seven members, a legislative council of 24 members appointed for life, and a legislative assembly of 73 representatives. The province is divided into 29 judicial districts, whose courts have equal and ample jurisdiction excepting as to revision and appeal. The Court of Queen's Bench has a chief justice and five puisne judges, and the Superior Court a chief justice and 29 puisne judges. The Court of Appeal and the Superior Court (in revisions) sit only in Montreal and Quebec.

Finances.—The Dominion subsidy to the province in 1897 was \$1,086,714; provincial revenue, \$3,877,466; expenditure, \$4,892,282; gross debt, \$35,553,867; Dominion government debt allowance, \$2,549,214; other assets, \$11,286,177; net debt, \$21,718,476.

Population.—In 1897 the number of Indians in the province was 10,622, who cultivated 18,604 acres of land, and received \$117,311 for their various products. The government maintained 17 schools for Indian youth, which had enrollment 689 and attendance 317. Local estimates in 1898 gave Montreal 250,000 population; Quebec, 75,000; St. Hyacinthe, 12,000; and Rock Island, 5,000. See CANADA.

QUEENSLAND, a colony in Australia occupying the northeast portion of that continent and having an area of 668,252 sq. m. with a population in 1895 of 460,550. An estimate on December 31, 1896, places it at 472,179. Many Chinese and Polynesians immigrate to Queensland but the net gain to the country through immigration is small since emigration nearly keeps pace with it. In 1896 the immigration was 18,765 and the emigration 16,824. The capital is Brisbane which, with South Brisbane and including a radius of ten miles, had a population in 1896 of 100,913. Other important towns are Ipswich, Rockhampton, Maryborough and Townsville. Grazing and agriculture are the chief occupations but a large part of the population are engaged in the industries, especially in mining. The mineral resources include gold, which was discovered in 1858, coal, tin, silver, copper and lead. The chief exports are gold, copper, wool, sugar, animal products, tin, silver, pearl shell and fruit, and the largest share of the trade is with Great Britain and her colonies. In 1896 there were 10 grammar schools with 66 teachers and 698 pupils; 772 public primary schools with 17,017 teachers and 54,316 pupils; 175 private schools averaging 10,570 in daily attendance. For purposes of defence there is an organized force of about 2,800 men together with some 2,000 militia; and the navy consists of 2 gunboats, 1 torpedo boat, 1 picket boat and 5 naval brigades. In the year 1896 the total extent of land under crop was 322,678 acres; the live-stock consisted of 452,207 horses; 6,507,377 cattle; 19,593,696 sheep; and 97,434 pigs; there were 115,715 acres of maize under cultivation; 35,831 acres of wheat and 83,093 acres of sugar cane. In 1896 the gold sent from the Queensland diggings amounted to 640,385 ounces and from the beginning of gold mining to the end of 1896, 11,198,190 ounces of gold were exported. In 1896 the vessels which entered the ports of Queensland numbered 649 with an aggregate tonnage of 562,759 and 645 vessels with a tonnage of 531,289 cleared. In 1896 the wool exports were valued at £2,984,210; sugar, raw and refined, at £863,080; preserved and salted meat at £344,318; frozen meat, at £491,850. The imports in 1896 were £5,433,271 and the exports £9,163,726. The gross revenue for 1896-97 was £3,613,150 and the expenditure £3,604,264. At the end of 1896 there were 2,430 miles of railway and 10,026 miles of telegraph line. Of late years a brisk trade has arisen in American manufactures.

Queensland was formerly a part of the colony of New South Wales but became a separate and independent colony in December, 1859. The executive authority is vested in a Governor (Lord Lamington in 1898), who is the Commander-in-Chief of the troops, and the Vice-Admiral; the legislative authority is a bicameral parliament consisting of a legislative council, whose members are nominated by the crown for life and a legislative assembly whose members are chosen by universal manhood suffrage. The question of federal union of the Australian colonies came up for decision in Queensland in common with the other colonies toward the end of the year 1897 but it was not submitted to popular vote. Queensland sent no delegates to the federation convention which reassembled at Melbourne on January 20, 1898. It was professedly awaiting the action of New South Wales (q. v.). On April 12, 1898 the Premier, Sir H. M. Nelson became President of the legislative council and Mr. Byrnes assumed the Premiership. The latter died a few weeks later and was succeeded by the Hon J. Dickson.

The budget estimate for the current year showed a revenue of £3,882,400 and an expenditure of £3,866,500. See AUSTRALIAN FEDERATION.

QUINTARD, Rt. Rev. CHARLES TODD, D. D., Protestant Episcopal Bishop of Tennessee, died at Meridianville, Ga., February 15, 1898. Born in Stamford, Connecticut, December 22, 1824, he was graduated in medicine from the University of New York in 1847. The next year he became physician of the New York Dispensary, and, after having practiced in Athens, Georgia, he was called in 1851 to the chair of anatomy and physiology in the Memphis (Tenn.), Medical College. Having begun the study of theology he was ordained deacon in 1855 and priest in the following year; in 1858 he became rector of the Church of the Advent in Nashville, Tennessee. He served in the Civil War as chaplain, physician, and a surgeon in the Confederate army. On October 11, 1865, he was consecrated Bishop of Tennessee in St. Luke's Church, Philadelphia, Pennsylvania. He is the author of *A Plain Tract on Confirmation* and *A Preparation for Confirmation*. Bishop Quintard will perhaps be best remembered for his successful efforts in re-establishing the University of the South at Sewanee. For this institution, which had been impoverished by the war, he raised money in England and elsewhere, so that work was resumed in 1868, Bishop Quintard becoming the first Vice-Chancellor.

RADIUM (new element). See PHYSICS (paragraph Becquerel Rays).

RAIL JOINTS. See ELECTRIC WELDING, etc.

RAILWAY ASSOCIATION, AMERICAN, organized in 1886; has 244 railways belonging to it. President, E. D. T. Myers; Secretary, W. F. Allen. Headquarters, 24 Park Place, New York.

RAILWAYS. The total railway mileage of the United States on December 31, 1897, was, according to the most reliable statistics which are available, 179,692 miles. During the year 1898 the mileage of new lines constructed was in round figures approximately 3,000 miles. This new line was built mostly in the southern and southwestern States, but important individual lines were built in Maine, Pennsylvania, North Carolina, and California. Probably, however, the most important new railway line built in North America was the extension of the Canadian Pacific Railway through the Rocky Mountains by the Crow's Nest Pass to open up rich, new mining districts in British Columbia. A narrow gauge line was also built in Alaska to open up the Klondike mining regions, being the pioneer railway line of that territory.

Among the European and Asiatic countries Russia takes the lead in railway construction. On Dec. 31, 1897, the total mileage of line constructed was 27,800 miles, with 7,440 miles in course of construction. Imperial sanction has been accorded to some 2,300 miles in addition since that time. Of that country's new railways the Trans-Siberian line is the most notable. This line now carries traffic east to Irkutsk, and is being extended through Manchuria to some point on the Pacific coast, possibly Peking, China, which is 1,300 miles from Irkutsk. Russia's two other chief railways are the Caucasian and Trans-Caspian. In China a very extensive programme of railway construction was promulgated early in 1898, but both the internal and international complications of the succeeding months have tended effectually to prevent much progress. The projected lines included one of 1,500 miles to join Peking and Canton, one of 2,500 miles to connect Shanghai with the upper Yangtse valley, and a third of 1,500 miles somewhere in the territory west of Canton. At the present time there are two lines of railway in actual working operation in China; one running from Tientsin to Chang-nan-So, 214 miles, and one from Tientsin to Peking, 80 miles long.

In South Africa much work is being done both in improving existing lines and in building new ones. Some of these roads are of considerable length, but by far the longest and most notable of the projected lines in the Dark Continent is the 5,000 mile railway to connect Cairo with the Cape. In India and Australia the English have conducted a quite general extension of existing lines and have carried through the surveys for a large number of new roads, but it is too early to secure details of this work. In Western Europe France has been particularly active in constructing new lines of access into Paris and in double tracking and otherwise improving important lines of her railway systems.

Cars.—A notable increase in size and capacity has signalized recent car construction. In 1875 the normal capacity of freight cars was from 20,000 lbs. to 25,000 lbs., and in 1885 this normal capacity had grown to 40,000 lbs. and 50,000 lbs., and in that year cars of 60,000 lbs. had begun to be built. Few cars of less than 60,000 lbs. capacity are now used for general freight service, and there is a decided tendency to increase the capacity to 70,000 lbs. and 80,000 lbs. For special coal and ore traffic steel cars of 100,000 lbs. and 110,000 lbs. capacity are in use to a considerable extent. The following table gives an interesting comparison of several of the most recent of these high capacity cars:

MATERIAL.	Rated capacity.	Empty.	Weight loaded.	Per wheel.	Size of journals.
	lbs.	lbs.	lbs.	lbs.	inches.
Wood.....	80,000	80,000	110,000	9,167	3½ x 7
".....	80,000	81,500	111,500	13,988	5 x 9
Steel.....	100,000	84,000	134,000	16,750	5 x 9
".....	100,000	26,000	126,000	15,750	5 x 9
".....	100,000	84,000	134,000	16,750	5½ x 10
".....	110,000	84,000	144,000	18,000	5½ x 10

Locomotives.—As with cars the most notable general feature of locomotive construction has been the great size and weight of some of the engines designed for freight service. The heaviest engines built during the year and it is asserted upon good authority, the heaviest ever built were constructed for the Union R. R. of Pittsburg, Pa. These are consolidation locomotives with four pairs of drivers, and weigh 208,000 lbs. on the drivers, or 230,000 lbs. altogether. The length over all is 39 ft. 8¾ ins. The total weight of the engine and trucks is 334,000 lbs. The cylinders are 23 x 32 ins. The grate area is 33½ sq. ft. and the total heating surface is 3,116½ sq. ft. The total estimated tractive force is 53,892 lbs. The weight on each driver is 26,000 lbs. Earlier in 1898 some 12 wheel locomotives were built for the Great Northern Railway, which weighed 212,750 lbs., 172,000 lbs. being on the drivers.

Stations.—One of the most notable railway stations recently built is the Union Terminal Station completed in 1898 at Boston, Mass. The tracks of eight different railway lines enter the two floors of this station. On the lower floor below the street level are two loop tracks which connect with the main tracks at points about one-half mile from the station and on which most of the suburban trains enter and leave the station. On the upper floor are 28 sub-tracks capable of holding 350 passenger cars upon which "through" trains are accommodated. The train shed covering these 28 tracks is 560 ft. wide, with a steel truss roof carried by two rows of interior columns besides the wall columns. The station proper is roughly a U-shaped building surrounding three sides of the train shed, the head house containing the waiting rooms and other accommodations for travelers being at the front end of the shed. The baggage rooms, etc., are on the two sides.

RAILWAY CARS. See RAILWAYS.

RAILWAY STATIONS. See RAILWAYS (paragraph Stations).

RAINS, General GEORGE WASHINGTON, Confederate veteran, died at Newburg, New York, March 21, 1898. He was born in Craven county, North Carolina, in 1817; was graduated from the Military Academy at West Point in 1842, served in the engineer and artillery branches, and in 1844-45 was assistant professor of chemistry, mineralogy, and geology at West Point. He was on the staffs of General Scott, and General Pillow in the Mexican War, and was brevetted captain and major for gallantry at Churubusco, Contreras, and Chapultepec; he served in the Seminole War, was promoted captain, and resigned, engaging in iron manufacturing at Newburg. On the outbreak of the Civil War he was commissioned colonel in the Confederate service and rose to the rank of brigadier-general in 1865. In 1867 he accepted a call to the chair of chemistry and pharmacy in the University of Georgia.

RAPID TRANSIT. This in its true sense refers to the rapid handling of passenger traffic in cities. The evolution from horse, to cable, to trolley electric, and in the case of several of the larger cities, to conduit electric, has been very rapid and most satisfactory. Each year the importance of being able to get from one part of the city to another quickly, comfortably and safely, increases. Regarding the subject of Rapid Transit, Mr. Edward E. Higgins stated before the Franklin Institute:—"The world's great cities are nearly all built upon or around some form of water front—sea, lake or river. Upon some section of this water front is always found the 'congested district' devoted to commercial and business purposes. The manufacturing districts of a city may or may not be on this water front, according to the location of the railroad termini and branches, the presence or absence of rivers tributary to the main water front, and other governing conditions. All, or nearly all cities are laid out and developed on one of four distinctive plans. (1) the peninsula plan, such as that of New York City (Manhattan Borough) and San Francisco; (2) the valley plan, with a river or rivers running through the centre, such as Pittsburg; (3) the radiating plan, with territory on one side only of water front such as Chicago, Boston, Brooklyn and many other cities; and (4) the radiating plan, with territory on both sides of the water front, of which examples are found in Metropolitan New

York (including Eastern New Jersey), Paris, London and many other cities, large and small."

There are extensive Rapid Transit systems in operation in all American cities of any size and in the principal foreign cities. In the United States the common system is the surface road operated by electricity; the overhead trolley being most frequently used. In New York, elevated roads have been operated with steam locomotives for many years. Among the Rapid Transit systems either under way, or completed, may be mentioned: The Boston Subway, Boston, Mass.; the Central London Underground, London, Eng.; the Metropolitan and Belt Railways of Berlin and the Metropolitan Railway of Paris.

The Boston Subway.—The great number of radiating electric street railway lines, converging at the centre of the city, the enormous traffic, the narrow and circuitous nature of the streets and the large amount of traffic of heavy wagons and carts made it necessary for the city to adopt some means of relieving the congestion. This was accomplished by the construction of a subway under this congested section, and the surface electric cars were run through the tunnel, leaving the streets comparatively free for ordinary traffic. This subway includes about 5,600 feet of four track and 3,500 feet of double track. It starts at the terminal station of the Boston & Maine R. R., and continues under the streets to the junction of Tremont street and Shawmut avenue where one double track subway rises up by an open incline to the street level. The other continues on to Park Square and Charles street where it rises by an incline in the Public Gardens. The tunnels are constructed in general of inverted sidewalls of vertical steel columns with concrete filling between them and a roof of plate girders or cross "I" beams with brick arches sprung between them, and a concrete covering. In the four-track sections there is a central row of steel columns supporting the roof. The double track is 24 ft. wide and 14 ft. high; the four-track sections 48 ft. wide. Ventilation is accomplished at the 5 stations and at 8 intermediate points, where large exhaust fans operated by electric motors are placed in niches in the side of the tunnels and are connecting with discharge stacks projecting above the street level. Drainage is taken care of by proper grades, drainage wells and electric pumps. The maximum grade is 8 per cent., but there are several 5 per cent. grades.

The entire track is standard 85 lbs. per yard with a special guard rail weighing 43 lbs. per yard bolted to it; oak and chestnut ties are used. These were first treated with a moisture-excluding preparation. Overhead an inverted wooden trough of cypress lumber is secured to the iron work of the roof structure, sheet rubber being used to insulate. The trolley wire is suitably supported inside this. Current is taken from the power stations by heavy feeders which are connected to the trolley at intervals. The tunnel is lighted by incandescent lamps run in lines at each side of the subway and also on the roof, placed 36 ft. apart. Stations are lighted by arc lamps. Three lines of 3-in. wrought iron water pipes are provided and properly equipped for fire protection. At stations the side walls are lined with white enamel brick; elsewhere a white coating is applied to the brick or concrete surface and the iron is painted white. The estimated cost was \$4,000,000, but the entire subway was constructed for about \$3,700,000. In its construction 148,500 barrels of Portland cement and 4,500 barrels of Rosendale cement were used, also the following materials were handled:

Excavation.....	369,450 cubic yards
Concrete.....	75,660 cubic yards
Brick.....	11,105 cubic yards
Steel.....	8,105 tons
Granite.....	2,285 cubic yards
Piles.....	117,925 linear feet
Ribbed tiles.....	12,440 square yards
Plaster.....	88,190 square yards
Water-proofing (asphalt coating).....	117,980 square yards
Artificial stone.....	6,790 square yards
Enamelled brick.....	2,210 square yards
Enamelled tile.....	2,855 square yards

The subway is owned by the City of Boston and is leased to the West End Steel Ry. Co., of Boston, which company pays a rental of $4\frac{7}{8}$ per cent. of the cost of the completed subway. The city borrowed money to build the subway at less than $3\frac{1}{2}$ per cent. which leaves $1\frac{3}{8}$ per cent. for a sinking fund. The railway company lights the subway and installs all equipments necessary for the operation of the railway. Work was begun on March 28, 1895. During the past year about 14,500,000 persons were carried entirely or partially through the subway.

Central London Underground Electric R. R.—This consists of two tunnels which start from the Great Eastern R. R. Co's. station and the city terminus of the North

London R. R., as well as the Bishopgate street station of the Metropolitan Underground Ry. and proceed almost in a straight line due west under the busiest part of the city to Shepard's Bush, a distance of $6\frac{1}{2}$ miles. Fourteen stations, including the terminals have been constructed and connecting these the tunnels run at a depth of from 40 to 102 ft. below the surface. About 35 per cent. of the operating power will be saved by giving a 3 per cent. down grade on the departing and a 3 per cent. up grade on the arriving side of each station. The tunnels are $11\frac{1}{2}$ ft. inside the cast iron lining, and in driving Greathead shields $12\frac{3}{4}$ ft. in diameter were employed; these were driven ahead by 6 hydraulic jacks having a combined power of 230 tons. At stations the tunnels run into one large tunnel 21 ft. in diameter and about 300 ft. long to allow for platforms. The track consists of 100 lbs. per yard, steel rails laid on stringers supported in concrete ballast. Current for operating the electric locomotives will be taken from a heavy steel third rail, in sections, which are connected with the sub-stations and signal towers.

The Power Station at Shepard's Bush contains six 1,300 H. P. Horizontal Corliss Engines, built by E. P. Allis Co., Milwaukee, Wis., which are directly connected with six General Electric three-phase 850 K-W. 25 cycle 94 revolutions per minute generators, supplying current at 5,000 volts, which is transmitted to four sub-stations, where static transformers drop the pressure from 5,000 to 330 volts or that necessary for the rotary converters. These transform the alternating current to direct current at 550 volts, at which pressure it is supplied to the feeders tapping the third-rail. There will be 32 locomotives each of from 150 to 200 horse-power, weighing 42 tons with a draw bar pull of 14,000 pounds. They have 4 motors taking at full load 123 amperes each. They are to make the round-trip run of 13 miles at a rate of 14 miles per hour, allowing 20-second stops at the 14 intermediate stations. Trains of 7 cars will be run on 2-minute schedule, each train will weigh 105 tons (235,200 lbs.), including 336 passengers. At each station electric elevators, 48 in all, are provided; these vary in size from 117 sq. ft. to 250 sq. ft. and are placed in circular cast iron lined shafts; 18-ft. spiral stairways are also provided. The elevators were designed and manufactured in the United States by the Sprague Electric Co.; the contract being the largest elevator order ever placed.

The Metropolitan and Belt Railways of Berlin.—In 1872 the Deutsche Eisenbahn, Gesellschaft asked for a concession for building a railway through the city of Berlin, but was unsuccessful. In 1873-4, another company—the Berliner Stadt Eisenbahn Gesellschaft, succeeded in getting a contract with the city and started on a 4-track viaduct for passenger service, connected with the railways of the city. Slow appropriations delayed the work, so that at the end of 1877 only about 3,000 feet of viaduct had been constructed. In 1878 the government took hold of the work and completed 9,184 feet. Work was continued, and on May 15, 1882, the line was opened for traffic. The total cost was \$17,032,250. The road includes 39,835 feet of viaduct of which 16,038 feet is a curvature with radii varying from 918 to 1,640 feet. The viaduct is mostly masonry, the streets being crossed by girders with a clearance of 14.43 feet. At the ends for distances of 2,214 and 5,520 respectively the tracks rest upon earth embankments, 26,122 ft. are masonry and 5,979 ft. are metallic viaduct and bridge work. Two of the tracks are reserved for city service, and secondary stations, and the other two for the trunk-line railways and the great stations. The stations vary from 2,263 ft. to 5,543 ft. apart. Of these, 5 are main stations and 6 intermediate. The large stations have platforms from 32.8 to 49.2 feet wide and from 656 to 820 feet long, and are provided with waiting rooms, elevator stairways, restaurants ticket offices, etc. Platforms for the smaller stations run from 23 to 30 feet wide and from 426 to 558 ft. long with coverings over the local tracks with glazed shelters for passengers and station master. Admission to these stations is only possible on the payment of the lowest fare of $2\frac{1}{2}$ cents.

The Metropolitan Railway of Paris.—There are now in process of construction six lines of underground and viaduct railway in the city of Paris, which, including branches, have a total length of 34.3 miles. Tunneling will be done using hydraulic shields. 70 per cent. is underground; 14 per cent. and 16 per cent. open cuts or on viaduct. The width of gauge will be 4 ft. $8\frac{3}{4}$ inches; and the cars will be 7 ft. $10\frac{1}{2}$ inches wide with 27 inches between sides of cars and the sidewalls. Double track will be used throughout. The tunnel between the 123 stations will be 6.6 meters (22 ft.) wide at level of rails, 7.1 meters (23.6 ft.) at the spring of the arch with a height at the middle of 5.2 meters (17.3 ft.). Stations will include two parallel platforms long enough for six cars 75 meters long (250 ft.), and 4 meters wide (13 ft.), and here the tunnel will be enlarged to an ellipse of 14.9 meters by about 6 meters. Open cuts will be covered by steel girders and brick or concrete arches, above which will be relaid the street pavement. Trains will be propelled by electric locomotives, current being taken from the usual third-rail alongside the track. They will consist of four cars with seats for 50 in each; not less than 16 or more than 32 trains are to be run each way per hour. The maximum speed is to be 22.3 mile

per hour. The construction of the subway stations, etc., will be done by the city of Paris, the estimated cost being \$33,000,000, of which \$3,000,000 is allowed for works of art and administration. The entire subway is leased to the General Traction Co., the annual rental being 1 cent on each second class ticket, and 2 cents on each first class ticket sold.

The total rental is fixed at \$1,100,000 thus requiring 110,000,000 passengers per year or about 3,213,000 per mile. It is expected to have most of the system in operation in time for the Paris Exposition of 1900.

RAWLINSON, SIR ROBERT, K. C. B., a London civil and sanitary engineer, was born in 1810 and died May 31, 1898. He was one of the pioneers of sanitary science and was the first chief engineering inspector of the Local Government Board, 1849-88. In the latter year he was made a K. C. B. He was a member of the army sanitary committee in the Crimea and Vice-President of the Society of Arts.

READING, PSYCHOLOGY OF. See PSYCHOLOGY, EXPERIMENTAL (Paragraph Clark University).

RECHABITES, INDEPENDENT ORDER OF, a fraternal society, founded in England in 1835, in America in 1842, has in America 5 tents, 42 sub-tents, and 2,700 members. There are 230,438 members throughout the world. High-Chief Ruler, Samuel C. Coleman, East Liverpool, O.; High-Secretary, James H. Dony, Anacostia, D. C.

RECREATION PIERES. See PARKS AND PLAYGROUNDS.

RED CROSS SOCIETY, THE AMERICAN NATIONAL, incorporated in Washington, D. C. in 1881, re-incorporated in 1893. Its aim is to provide relief during war, famine, pestilence, floods, fires, and any great calamity. It acts under the Geneva Treaty signed by all civilized nations, the United States having signed in 1882. The Red Cross accomplished efficient work during the Spanish-American War. It employed hundreds of agents, nurses, physicians, and ambulances. The relief committee was organized May 3, 1898, with the following officers: Rt. Rev. Henry C. Potter, Chairman; Alexander E. Orr and William T. Wardwell, Vice-Chairmen; John P. Faure, Secretary; Frederick D. Tappen, Treasurer; Samuel Woolverton, Assistant Treasurer. Sub-committees were appointed as follows: Executive, Wm. T. Wardwell, Chairman; finance, J. Pierpont Morgan, Chairman; supplies, Cleveland H. Dodge, Chairman; committee on yacht "Red Cross," William T. Wardwell, Gustav H. Schwab, Alexander E. Orr; medical advisory board, Dr. William H. Draper, Chairman.

The Women's Committee on Auxiliaries authorized the organization of 92 auxiliaries and sub-auxiliaries throughout the country.

The cash contributions amounted to \$207,425.73, and the value of clothing, food, etc., is estimated at \$146,000. In Cuba the Red Cross work began with the efforts of Stephen E. Barton and Miss Clara Barton to relieve distress. The committee sent the vessels *State of Texas*, *Port Victor*, *Nokomis*, *San Antonio*, and *Morse*. Among the Red Cross nurses Miss Isabella E. Rutty, who had charge of the *Lampasas*, with a corps of nurses followed the fleet to Porto Rico. Headquarters, Washington, D. C. President and Treasurer, Clara Barton, General Secretary, W. P. Phillips. See SPANISH-AMERICAN WAR and UNITED STATES.

RED MEN, IMPROVED ORDER OF, a fraternal society organized in 1771 and 1834, has 42 great councils, 1,953 tribes, and 197,068 members. During its last fiscal year it disbursed \$530,711.

REFORMED CHURCH IN AMERICA, DUTCH. An important event in 1898 was the meeting of the General Synod, which took place at Asbury Park, N. J., June 1, 1898, at which Rev. J. H. Gillespie was appointed professor of Hellenistic Greek in the New Brunswick, N. J., Theological Seminary, to replace Prof. James F. Riggs, resigned. The Reformed Dutch Church maintained missions among the negroes, and the Indians, and in India, Japan, Arabia, and China. The 93d General Synod of the Reformed Church will be held at Catskill, N. Y., in June, 1899. Officers for the General Synod are, Edward B. Coe, President; Samuel M. Zwemer, Vice-President; William H. De Hart, Stated Clerk; and Rev. William H. Ten Eyck, Permanent Clerk. This sect now consists of 633 churches, 683 ministers, and 110,273 members. It has 123,857 Sunday-school scholars and contributed \$331,626 for benevolent purposes. Connected with the Christian Endeavor societies, of which there are 634, there are nearly 200 missionary leagues. The work of missions in 1898 exceeded \$7,000. The Reformed Church controls 7 colleges, with 90 instructors, 692 students and an endowment fund of \$1,403,344.

REFORMED CHURCH IN THE UNITED STATES, GERMAN. One of the most important events connected with the history of this organization for 1898 was the removal of the Theological School of Ursinus College to Philadelphia,

This denomination has now, 1,660 congregations, 1,029 ministers, and 242,299 members. Its benevolent contributions for 1898 were \$202,726.

REFORMED EPISCOPAL CHURCH of the United States reported for 1898 103 clergymen, 104 churches, and 9,743 members. The bishops are: Charles E. Cheney, Chicago; William R. Nicholson, Philadelphia; Edward Cridge, Victoria, B. C.; Samuel Fallows, Chicago; P. F. Stevens, Orangeburg, S. C.; James A. Latane, Baltimore; and Edward Wilson, Metuchen. The 14th general council will be held in Baltimore in June, 1900.

REFORMED PRESBYTERIANS. The most important work of the year was the mission work in India, where there are two presbyteries, 10 stations and congregations, 9 ministers, 1,230 members, 2 licentiates, and 5 students of theology. Other stations in China, near Canton, in Syria, Asia Minor, and Cyprus also report success. Reform and evangelization were carried on, especially among the Indians in the Indian Territory, the freedmen in Selma, Ala., among the Jews in Philadelphia, and the Chinese in Oakland, Cal. During the year a Synodic Women's Missionary Society was organized. This branch of the Presbyterian Church reported in 1898, 109 churches, 116 ministers, and 9,634 communicants, 3 institutions of instruction and total contributions of \$162,950.

REFRIGERATION. See LIQUID AIR.

REFUSE DISPOSAL. See GARBAGE.

RELIGIONS OF THE WORLD. The report for 1898 gives:

Roman Catholics	230,866,533	
Protestants	143,237,625	
Orthodox Greek Church.....	98,016,000	
Church of Abyssinia.....	3,000,000	
Armenians	1,690,000	
Coptics	120,000	
Nestorians	80,000	
Jacobites	70,000	
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Making	477,080,158	Christians.
Confucians	256,000,000	
Hindoos	190,000,000	
Mohammedans.....	176,834,372	
Buddhists	147,900,000	
Polytheists	117,681,669	
Taoists	43,000,000	
Shintoists	14,000,000	
Jews	7,186,000	
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Making	952,602,031	non-Christians.
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In all	1,429,682,189	

REMENYI, EDOUARD, Hungarian violinist, died at a theatre in San Francisco, California, May 15, 1898. He was born about 1830 at Morcolc, Hungary; studied at the Vienna Conservatoire under Joseph Böhm, the instructor also of Joseph Joachim. Remenyi took an active part in the Hungarian uprising of 1848, being an aid to General Görgey, and this resulted in his expulsion from the country. At Weimar he made the acquaintance of Franz Liszt, who became his friend and musical advisor; in 1854 he went to London, where he was appointed solo violinist to the Queen, and, obtaining an amnesty in 1860 and returning to his own country he received a similar honor from the Austrian Emperor. Remenyi travelled and became famous in almost all the civilized countries of the world, including Australia and India; he was a well-known figure in New York. He was noted for his rendering of Hungarian melodies; his technique was good and his interpretation poetic, while his repertoire comprised the most eminent composers. He was not, however, in the foremost rank of violinists and was not remarkable as a composer, though his hymn to Mount Shasta gained much popularity in the United States. In his later years he lost his former prestige, his faults increasing without any compensatory advance in his merits, and a year or so before his death he played in some of the cheaper music halls and continuous performance theatres.

RESERVOIRS. See WATER-WORKS.

RESISTANCE OF ELECTROLYTES, MEASUREMENT OF. See PHYSICS (paragraph Electrical Measurements by Alternating Currents).

RESISTANCE, STANDARD HIGH. See PHYSICS (paragraph Standard High Resistance).

RESZKE, EDOUARD DE, opera singer, brother of Jean de Reszké, was born in Warsaw, Poland, Dec. 23, 1855. He studied singing under Jean de Reszké, Ciaffei Steller, and Coletti, and made his *début* as the King in *Aida* in Paris in 1876. In 1880 he sang for the first time in Italy and in 1881 achieved great success in London. His first American appearance was made in 1891-92, since which season he has sung in New York with his brother. His great rôles are "Mephistopheles" in *Faust*; "Friar Lawrence," in *Roméo et Juliette*; "Leporello" in *Don Giovanni*; the Wagnerian characters of "Wotan," "Hans Sachs" and "Hagen;" "St. Bris," in *Les Huguenots*; and "Don Basilio," in *Il Barbiere di Siviglia*. His voice is extraordinary in power and range.

RESZKE, JEAN DE, opera singer, born in Warsaw, Poland, January 14, 1852, was taught singing by his mother, a distinguished amateur, and by Ciaffei, Cotogni, and Sbriglia. He made his *début* in Venice as "Alfonso" (baritone), in *La Favorita*, in 1874, under the name of De Reschi, with great success. At Drury Lane he played "Don Giovanni," "De Nevers," "Almaviva," and "Valentine" in that year, but some critics even then called his voice a low tenor. In 1876 he sang in Italy under his own name, and in 1879 made his tenor *début* as "Robert" in Madrid. In 1883 he sang at Maurel's Theatre in Paris and won great honors. Massenet engaged him to create the part of *Le Cid* in 1885; in 1887 he achieved triumph in *Aida* in London; and since 1891-92 he has sung almost every season in New York. He is considered the greatest tenor since Mario. His *répertoire* is enormous, and during the last few years to his lyric rôles he has added the Wagnerian tenor characters. He sang in the Nibelungen Trilogy, given in London in June, 1898, and was a member of the Grau Company of 1898-99.

REUNION ISLAND, formerly known as the Isle de Bourbon, belongs to France. It is situated in the Indian Ocean about 420 miles east of Madagascar, and has an area of 965 square miles with a population in 1893 of 171,713. It is represented in the French legislature by a Senator and two Deputies, and its towns are under French municipal law. Sugar, coffee, cacao, vanilla and spices are raised there. The principal port is Pointe-des-Galets.

RHODE ISLAND, a New England State, has an area of 1,250 sq. m. Capitals, Providence and Newport.

Mineralogy.—The principal economic production is granite, from quarries at Westerly and Niantic, and chiefly for monumental work. The output of 1897 was valued at \$629,564, showing a steady decline since 1894, when it reached the high figure of \$1,211,439, and reducing the State from third to fifth place. Limestone yielded \$11,555, making the total quarry output \$641,119.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 262,820 bushels, value \$168,205; oats, 98,631, \$36,493; barley, 8,904, \$5,431; potatoes, 853,005, \$545,923; and hay, 88,814 tons, \$1,123,497—total value, \$1,879,549. Live-stock comprised, horses, 10,281; milch cows, 25,511; other cattle, 10,356; sheep, 10,715; and swine, 13,722—total head, 70,585.

Manufactures.—According to the State census of 1895, there were 1,263 manufacturing firms, employing \$126,207,790 capital and 77,995 persons; paying \$30,874,281 for wages and \$54,168,231 for materials; and having a combined output valued at \$116,116,826. The textile machinery in use consisted of 2,329,303 spindles, 50,651 looms, 587 cards, 199 combs, 7,522 braiding machines, 1,684 knitting machines, and 192 spinning frames. The value of the cotton goods production was \$24,392,788; woolen goods, \$26,729,458; all textile goods, \$65,656,007; jewelry, \$14,203,309; and machinery and metal goods, \$14,515,860.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise at Bristol and Warren, Newport, and Providence, aggregated in value \$705,493; exports (all from Providence), \$1,291; a decrease in a year of \$291,012 in imports and \$2,838 in exports. During the calendar year 1897 the commerce that arrived at and left the various ports by water aggregated 36,850,689 tons.

Banks.—On Oct. 31, 1898, there were 57 national banks in operation and 7 in liquidation. The active capital aggregated \$19,337,050; circulation, \$7,563,528; deposits, \$22,410,605; reserve, \$6,827,561; resources, \$55,387,225. The State banks, Nov. 19, 1898, numbered 6, and had capital, \$916,675; deposits, \$723,801; resources, \$1,911,560 (one, in Providence, went into liquidation); loan and trust companies, 8, with capital, \$2,840,255; deposits, \$20,922,885; resources, \$26,053,275; surplus, \$1,139,100; and mutual savings banks, 29, with depositors, 138,301; deposits, \$69,434,455. In the year ending Sept. 30, 1898, the exchanges at the U. S. clearing house at Providence aggregated \$264,545,500, an increase in a year of \$2,522,900.

Education.—At the end of the school-year 1896-7, there were 75,262 persons of school age in the State, of whom 62,337 were enrolled in the public schools, and

49,224 were in daily attendance.. There were 521 public school houses; 1,817 teachers; public school property valued at \$4,414,512; and expenditures, \$1,731,735, including \$933,680 for teachers' salaries. For higher education there were 14 public high schools; 11 private secondary schools; a public normal school; Brown University, with 76 professors and instructors, 850 students, and \$170,000 income; and a college of agricultural and mechanical arts, which received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. The enumeration of 1898 showed a school population of 79,299, and the apportionment of public school money among the cities and towns aggregated \$120,000. Periodicals numbered 69; dailies, 16; weeklies, 36; monthlies, 11.

Railroads.—Of eighteen steam railroads in the State all but 4 are controlled by the New York, New Haven, and Hartford railroad company. Reckoned as a single track, these roads have a total mileage of 479. The controlling company erected a commodious union station in Providence in 1898. The street railroads, which connect all important cities and towns, had a total length of over 165 miles.

Finances.—The treasury receipts in the calendar year 1897 were \$1,405,680; disbursements, \$1,329,013; total funded debt, Jan. 1, 1898, \$1,500,000; sinking funds, \$209,422; net debt, \$1,290,578. The sinking funds largely comprise local securities, and receive about \$50,000 annually. The assessed valuations by cities and towns, with four exceptions for 1898, aggregated, real estate, \$308,665,777; personal, \$82,321,038—total, \$390,986,815.

Population.—State census of 1895, 384,758; estimated by Federal officials, June 30, 1898, about 405,000. Local censuses and estimates gave Providence, 167,332; Pawtucket, 32,577; Newport, 21,537; Westerly, 7,636; Bristol, 6,730.

Legislation.—The legislation during the year was comparatively unimportant. An act was passed enabling soldiers to vote in the field. Another allowed minors under sixteen a separate trial when charged with crime or misdemeanor, and certain charitable societies are appointed to procure counsel and look after the trial. If the minor is under thirteen and cannot procure bail, he shall be committed until trial to the agents of said societies so that he may not have to associate with older and hardened offenders.

A law was also passed giving certain franchises in perpetuity to street railway companies in consideration of an annual tax of one per cent. of their earnings and also the payment to the State of all dividends exceeding eight per cent. per annum. This is in addition to the existing taxes and charges paid to towns and cities. Among the minor enactments were: An amendment to the law "For the Suppression of Intemperance;" a law to secure a more uniform high standard in the public schools; to diminish the danger of fires in the cities of the State; and to provide for a tax on street railways.

Elections.—At the State and Congressional elections the Republicans reelected Elisha Dyer as Governor. The only State issue of the campaign was a proposed bond issue of \$800,000 to complete the new State House. Originally it was said that this would only cost \$1,500,000, whereas it will amount to \$3,000,000. The proposed bond issue was defeated at the polls. The Democratic platform demanded the retention of the Philippines. On the whole only a languid interest was taken in the election. The Democratic vote was twelve hundred less and the Republican was nearly thirteen thousand less than in 1896. The surprise was furnished by the Socialist vote which was found to have grown from 1,300 to nearly 3,000 since the last election.

The Proposed Revision of the Constitution.—The new constitution, submitted to the people at the November elections, lacked only about one thousand of the necessary three-fifths vote for approval. It is again to be submitted to the people. The cities were favorable and the country districts were hostile to it. The rejected measure contained an educational test for the suffrage, gave the Governor the veto power, provided for biennial instead of annual election of officers and Representatives, and annual instead of semi-annual sessions of the legislature, and tried to remove the inequality of representation in the State legislature. On the other hand it retained many features of the old constitution which were regarded as objectionable, and imposed a restraint on future modifications by requiring that amendments should receive the approval of two-thirds of the members of two successive legislatures before being submitted to the people, and by providing that intervals of twenty years must elapse between the conventions for the revision of the constitution. Under its provision the city of Providence would have a quarter of the whole membership of the House of Representatives.

National Representatives and State Officers.—Rhode Island's Representatives: Melville Ball (Rep.), from Middletown and Adin B. Capron (Rep.), from Smithfield. Senators: Nelson W. Aldrich (Rep.), from Providence, and C. Peabody Wetmore (Rep.), from Newport. Officials: Elisha Dyer, Governor; William Gregory, Lieutenant-Governor; Charles P. Bennett, Secretary; W. B. Tanner, Attorney-General;

Walter A. Read, Treasurer; F. M. Sackett, Adjutant-General; A. C. Landers, Auditor; and T. B. Stockwell, Superintendent of Education. All are Republican. Chief Justice, Charles Matteson; Associates, John H. Stiness, Pardon E. Tillinghast, George A. Wilbur, Horatio Rogers, W. W. Douglas, and Benjamin M. Bosworth; Clerk, B. S. Blaisdell. All are Republicans. There are 11 Democrats and 98 Republicans in the legislature.

RHODESIA is the local name for the territory administered by the British South African Company, and bounded on the south by the South African Republic (Transvaal), on the north by Congo Free State and German East Africa, on the east by Portuguese East Africa, and on the west by Angola and German Southwest Africa. It comprises what is officially known as British Central Africa in the north, while the southern portion consists of the Bechuanaland Protectorate, Matabeleland, and Mashonaland. The Anglo-German agreement of 1890 defined its western boundary and the Anglo-Portuguese of 1891 its eastern. The southern portion, including Matabeleland and Mashonaland, was declared to be within the British sphere of influence in 1888 and in 1889 the British South Africa Company received by charter the power to administer the territory and to carry out important railway colonizing and industrial projects. The Company has done much to develop the country, especially by the building of railways and the extension of the telegraph system; it has under its influence a district covering about 600,000 square miles. The Zambesi river divides the northern from the southern portion. The country possesses great mineral wealth. Gold fields have been discovered covering an area estimated at over 5,000 square miles. The gold region is chiefly to the south of the Zambesi. The country has fine agricultural and pastoral lands. The Hon. Cecil Rhodes who was formerly the director of the British South Africa Company was removed on account of his connection with the Jameson Raid, and Earl Grey was appointed in his place in 1896. For a further account of the Company's affairs and the result of the investigation of its complicity with the Raid see the article **BRITISH SOUTH AFRICA COMPANY**.

The condition of Rhodesia or British South Africa can be best described under the heads of its component parts, Bechuanaland Protectorate, Matabeleland, Mashonaland and British Central Africa.

Bechuanaland Protectorate.—Until 1895 the Crown Colony of British Bechuanaland was included under the Company's jurisdiction along with the Bechuanaland Protectorate, but in that year the former was annexed to Cape Colony. The Bechuanaland Protectorate lies between the Molopo river on the south and the Zambesi river on the north and reaches from the South African Republic and Matabeleland to German Southwest Africa. It has an area of about 386,200 square miles. The chiefs of the tribes inhabiting it made an arrangement with the British government in 1895 whereby each was left to rule his own people under the protection of the Queen. The boundaries between the tribes were fixed and provision was made for the maintenance of order by a native police force. The representative of the Queen is a Resident Commissioner under the control of the High Commissioner. The natives have generally shown themselves friendly and peaceable. The chief occupations are cattle-raising and agriculture.

Mashonaland with an area of about 79,400 square miles lies to the northwest of Matabeleland and to the west of the Portuguese province of Lourenço Marques. It is a fertile and healthful country and well suited to European settlement. Transportation facilities are improving through the activity of the Mashonaland Railway Company. Its chief importance arises from the discovery of gold fields within its borders and a great number of prospectors have settled in the country from the neighboring States. There are townships at Salisbury, New Umtali and Melssetter, and a railway line is in process of construction from Beira on the coast to Salisbury, which when completed, will eventually open railway communication with Buluwayo. The tribes have shown at times a war-like spirit, and uprisings took place in 1896 but they were put down.

Matabeleland with an area, including its dependencies, of about 125,000 square miles and a population variously estimated at from 200,000 to 240,000, lies between the Limpopo and the Zambesi rivers and is bounded on the south by the Transvaal and on the east by Mashonaland. It is rich in gold and other minerals as well as in valuable agricultural land. An uprising of the natives led to an expedition of the South African Company against Buluwayo, after which the country was placed under the control of an administrator by the Company. Railway communications have recently improved, the line to the town of Buluwayo being completed in October 1897. Bridge-building has also made great progress and much is expected from the rapid improvement of the means of transportation. There was a revolt of the Matabele tribe in 1896 owing, it is said, largely to the Company's attempts to check the spread of the rinderpest among the cattle. The natives were brought to terms early in the autumn and promised afterwards to maintain peace. It was provided that native chiefs should have a definite share in the government of the country, which was

divided into twelve districts, each with its chief who was responsible to the government for the good conduct of the inhabitants. A native commissioner, resident at Buluwayo, was placed in charge of these local administrators. A report of the causes of the revolt was made to the government by Sir Richard Martin in February 1897. He declared that the native commissioners were guilty of forcing the inhabitants to labor for them, and he blamed the company for its mistaken policy toward the cattle question. The company disclaimed all blame for the occurrence.

British Central Africa is the official name of the land lying north of the Zambesi and south of German East Africa and Congo Free State, with an area of about 251,000 square miles and a native population of 650,000. Settlements have been formed near lakes Tanganyika and Mweru, and near Bangweolo. The British Central African Protectorate is distinct from the company's territory and is under a government commissioner.

RICHEBOURG, JULES EMILE, French novelist, died in Paris, January 26, 1898. He was born at Mouvy, Haute-Marne, April 23, 1833. After working a short time in a mercantile house, he was given a position on the staff of the *Figaro*; he wrote both prose and verse with little success and in 1857 published his first romance, *Contes Enfantins*; in 1862 he wrote in collaboration with Leon Pournin a fairly creditable five-act drama, *Les Nuits de la Place Royale*, and the next year he was still more successful in his one-act comedy *Un Ménage à la Mode*. Richebourg wrote a large number of stories of passion, adventure, and intrigue, many of which appeared in the *Petit Journal*. They were widely read in France by the common people.

RICHTER, HANS, musical conductor, born in Raab, Hungary, April 4, 1843, where his father was *capellmeister* of the cathedral. He studied in the Conservatory of Vienna, and for a time played the horn in the orchestra of the Kärnthnerthor Opera. He lived with Wagner at Lucerne and copied the score of *Die Meistersinger*. He was conductor in Munich and Pesth and attracted attention by his conducting of an orchestral concert in Vienna in 1875. In 1876 he conducted the rehearsals and performances of *The Nibelungen Trilogy* in Bayreuth. In 1875 he was made conductor of the Court Opera Theatre in Vienna which he held until 1898. He is now conductor of the Manchester Philharmonic Society. Since 1879 he has frequently conducted orchestral concerts in London. He is the greatest authority on Beethoven and Wagner, and has received many honors for his musical scholarship.

RIMSKI-KORSAKOFF, NICOLAI ANDREYEVICH, composer, born in Tikhvin, Russia, in 1844. He left the navy to become a musician, and in 1871 he was made professor of composition and instrumentation in the Conservatory of St. Petersburg. His works include operas, of which *Snegorutchka* (Snowdrop), first represented in St. Petersburg in 1882, is very popular; symphonies, orchestral works, chamber-music, piano music, songs, etc. His works are becoming very popular in Europe and America. See MUSIC.

ITCHIE, ANNE ISABELLA THACKERAY, author, born in London. She is Thackeray's eldest daughter and in 1898-99 was engaged in editing his works with valuable prefaces and annotations. Of her novels *Old Kensington* (1873) and *Miss Angel* (1875) are best known.

RITUALISM. See ENGLAND, CHURCH OF (paragraph Ritualistic Controversy).

RIVER, ALPHONSE PIERRE OCTAVE; born at Lausanne, Switzerland, November 9, 1835; died July 21, 1898. Since 1867 he had been professor of international law in the University of Brussels, and was recognized as a high authority on the subject.

ROBERTS, JOSEPH, Brigadier-General, U. S. A. (retired, 1877), died at Philadelphia, Pennsylvania, October 18, 1898. He was born in Delaware in 1814; was graduated at West Point in 1835. He engaged in the Creek War (1836), the Florida War (1836-37), the Seminole War, the Mexican War, and the Civil War. In the last-named he was chief of artillery of the Seventh Corps, and was brevetted Brigadier-General in March, 1865. General Roberts wrote *A Handbook of Artillery*.

ROBERTSON, WILLIAM H., jurist and politician, died December 7, 1898. He was born at Bedford, Westchester county, New York, October 10, 1823; educated at the Union Academy and afterwards taught school. Having studied law he was admitted to the bar in 1847 and continued for many years in practice at White Plains. He was elected to the Assembly in 1848, to the State Senate in 1853 and as county Judge in 1855, holding the last named office for three terms. In 1864 he was a member of the national Republican convention and in 1866 was elected to the XLth Congress. In 1871 he was again returned to the State Senate and was reelected four successive times. He is best known in connection with his appointment to the collectorship of the port of New York, an appointment which led to a split in the Republican party and the starting of the "Stalwart" movement under the leadership of Roscoe Conkling. He had incurred the enmity of Conkling by refusing to obey the

instructions issued by the State convention of New York that the New York delegation should vote as a unit at the national convention. These instructions had been voted at the instance of Conkling, who was heading a movement to nominate General Grant for a third term. The New York delegates, under the leadership of Judge Robertson, disregarded the instructions and Garfield was nominated by the Republican party. When Mr. Garfield, acting on the advice of Mr. Blaine, appointed Judge Robertson collector of the port of New York, Conkling resigned his seat in the Senate together with his colleague Thomas C. Platt and from that time the division of the party into the "Stalwart" and "Half-breed" factions led to constant internal strife. Judge Robertson was reelected to the State Senate after his retirement from the collectorship and served until he retired on account of age.

ROD, EDOUARD. See FRENCH LITERATURE (paragraph Fiction).

RODIN, AUGUSTE, sculptor, born in Paris in 1840. He is a pupil of Barye, and Carrier-Belleuse. His first exhibited work, a bust of M. Garnier, was exhibited at the Salon in 1875. *L'Age d'airain* (1877), reproduced in bronze, gained him a third-class medal, and was placed in the Luxembourg, where there are other examples of his works. He was decorated with the Légion d'Honneur in 1888. His statue of Balzac (1898), occasioned much discussion. See SCULPTURE.

ROENTGEN RAYS IN MEDICAL DIAGNOSIS. Prof. Küttner of Tübingen has found it rarely possible to take satisfactory photographs on account of the difficulty of bringing patients into proper positions. Splinters of bone and bullets which have penetrated into soft parts of the body can not be distinguished from each other; deep-lying masses of pus can not be located; injuries to the nervous system and the peripheral nerves are not discernible by the Roentgen rays. Yet in so many instances of fractures, foreign bodies, etc., he has found skiagraphy of use that he advocates equipping fixed hospitals, in time of war, with the X-ray apparatus. In the Royal Institute, London, a photograph of a brain in relief was shown, which enabled the operator to see the foreign body and also to measure correctly its distance from the outer wall of the cranium. Abbe, of New York, reports that he is using the Roentgen rays frequently in private and hospital work, as an aid to diagnosis, especially in obscure cranial conditions, possible presence of renal calculus, suspected fracture of the neck of the femur, etc. He has never seen the faintest "burn," after taking many hundred Roentgen ray pictures, with exposures frequently up to three-quarters of an hour. He always has the tube placed at a distance of 12 or 15 inches from the surface of the person photographed. The Roentgen rays enabled Prof. H. C. Bumpus and W. C. Cannon to count the number of vertebræ and locate the pelvis in 100 specimens of *Necturus*, and also to obtain figures showing the shape of the stomach during digestion. For the latter purpose a cat was used, and by mixing subnitrate of bismuth with the animal's food the wavy motions of the pyloric portion of the stomach were made clearly visible. E. B. Bronson, of New York, says that the X-ray injuries are not burns. He has seen nerves and even bones affected in some cases; in others he has seen deep, gangrenous inflammation as a result of exposure to Roentgen rays. The active agent, he claims, is not ozone, nor an electrical current, nor the bombardment of the tissues by minute particles of platinum, as suggested by Nicola Tesla. The injury takes place first in the deeper tissues as a result of the action of the rays themselves. The nerves are first involved, and there is also a grave involvement of the vascular system. S. D. Powell, of New York, claims to have cured several cases of Roentgen ray "burns" by cutting down through the affected part, excising the altered tissue, disinfecting with carbolic acid and then dressing the wound so that it shall granulate from the bottom. Tesla finds that these X-ray injuries can be avoided if an aluminum screen is used, provided that it is grounded.

At the January, 1898, meeting of the Roentgen Society, of London, Major J. Battersby, who has charge of the Roentgen ray apparatus in the Soudan, reported that skiagraphy had proved of great practical value in the detection and location of bullets, when the erratic course taken by these missiles after entering the body rendered their discovery by ordinary means exceedingly difficult if not impossible. After the battle at Omdurman there were 21 cases of gunshot wounds in which the bullets could not be found or their absence proved by ordinary methods. In 20 of these 21 cases an accurate diagnosis was reached with the help of the rays, the remaining case—of a soldier shot through the lung—being too ill for examination. In many other cases the use of the rays prevented much suffering, which the patients would have experienced from probing, exploring with the finger or enlarging the wounds in the ordinary search for bullets, as the skiagraphs at once located their position. The necessity for an apparatus which could be packed in small compass in panniers, or on either side of a mule's back in a pack saddle, was emphasized. The most serious difficulty seems to be the method of generating the primary electrical current for charging the storage batteries. In the Soudan a small dynamo, driven by means of a tandem bicycle, proved efficient and was readily transported by rail or boat, but was

unsuitable for transportation by mule, camel or human carrier. Major Battersby suggested that an ideal apparatus would consist of a modification, for example, of Wimshurst's statical, or friction, machine, whereby the focus tube could be excited direct. For the effect of Roentgen rays upon plants see BOTANY (paragraph Plant Physicology). See also the article PHYSICS.

ROGERS, WILLIAM AUGUSTUS, Ph. D., an American scientist of wide reputation, was born at Waterford, Connecticut, in 1832; died at Waterville, Maine, March 1, 1898. In 1896 he became professor of physics and astronomy in Colby University, Waterville, in which position he remained to the time of his death.

ROLLINS, Mrs. ALICE WELLINGTON, American writer, was born in Boston, Massachusetts, June 12, 1847; died at Bronxville, New York, December 5, 1897. She was a literary critic of considerable merit, being for many years a regular contributor to the *Critic*. She travelled extensively, and, her husband being a merchant in the South American trade, she lived for a time in Brazil. The reflection of her travels is found in some of her books; e. g., *The Story of a Ranch* and *From Palm to Glacier*, the latter being an account of travels in South America, Bermuda, and Alaska. She wrote several books for children, among which are *Little Page Fern* and the *Finding of the Gentian*. She published a number of poems, the best of which is probably *The Story of Asron*; her first volume of poems, *The Ring of Amethyst*, appeared in 1878. Among her other works are *Dealing in Futures*, a dramatic colloquy; the booklets, *Unfamiliar Quotations* and *Aphorisms for the Year*; and *Uncle Tom's Tenement* (1888), a novel written in the cause of tenement house reform.

ROMAN CATHOLIC CHURCH. The history of the Roman Catholic Church in America for 1898 is marked by its entering largely into politics, and its discussion of the life and influence of Father Hecker, founder of the Paulists. The report for 1898 gives 9,856,622 Roman Catholics in the United States, outnumbering all other denominations; 14,675 churches; 77 bishops, 10,911 priests; 97 seminaries, 16 universities; 215 colleges and 3,873 students. The Roman Catholic hierarchy in the United States is as follows: Apostolic Delegation, Sebastian Martinelli, Abp. Ephesus, Washington, D. C.; Rev. Donatus Sbarette, Auditor, Washington, D. C.; F. Z. Rooker, Secretary, Washington, D. C. Archbishops: James Gibbons (Cardinal), Baltimore, Md.; John J. Williams, Boston, Mass.; Patrick A. Feehan, Chicago, Ill.; William H. Elder, Cincinnati, O.; John Hennessy, Dubuque, Iowa; Frederick Katzer, Milwaukee, Wis.; P. L. Chapelle, New Orleans, La.; M. A. Corrigan, New York; Patrick J. Ryan, Philadelphia, Pa.; John J. Kain, St. Louis, Mo.; John Ireland, St. Paul, Minn.; and Patrick W. Riordan, San Francisco, Cal. The Sees of Portland, Ore., and Santa Fé, New Mexico, are vacant.

Bishops: Thomas M. Burke, Albany, N. Y.; James Ryan, Alton, Ill.; J. Janssen, Belleville, Ill.; F. J. Glorieux, Boise City, Idaho; John Brady, Boston, Mass.; C. E. McDonnell, Brooklyn, N. Y.; James E. Quigley, Buffalo, N. Y.; J. S. Michaud, Burlington, Vt.; H. P. Northrop, Charleston, S. C.; Thos. M. Lenihan, Cheyenne, Wyoming; I. F. Horstmann, Cleveland, Ohio; J. A. Watterson, Columbus, Ohio; J. F. Cunningham, Concordia, Kansas; C. P. Maes, Covington, Ky.; Edward J. Dunne, Dallas, Tex.; H. Cosgrove, Davenport, Iowa; N. C. Metz, Denver, Col.; John S. Foley, Detroit, Mich.; James McGoldrick, Duluth, Minn.; Tobias Mullen, Erie, Pa.; John Shanley, Fargo, N. Dakota; J. Rademacher, Fort Wayne, Ind.; N. A. Gallagher, Galveston, Tex.; H. J. Richter, Grand Rapids, Mich.; Sebastian Messmer, Green Bay, Wis.; Theodore Meerschaert, Guthrie, Oklahoma; M. Tierney, Hartford, Conn.; J. B. Brondel, Helena, Montana; S. F. Chatard, Indianapolis, Ind.; John J. Hogan, Kansas City, Mo.; James Schwebach, La Crosse, Wis.; P. Verdagner, Laredo, Texas; L. M. Fink, Leavenworth, Kan.; Thomas Bonacum, Lincoln, Neb.; Edward Fitzgerald, Little Rock, Ark.; G. Montgomery, Los Angeles, Cal.; William J. McCloskey, Louisville, Ky.; O. M. Bradley, Manchester, N. H.; John Vortin, Marquette, Mich.; Edward P. Allen, Mobile, Ala.; Thomas S. Byrne, Nashville, Tenn.; Thomas Heslin, Natchez, Miss.; Anthony Durier, Natchitoches, La.; Edward J. O'Dea, Nesqually, Wash.; W. M. Wigger, Newark, N. J.; John M. Farley, New York; Henry Gabriels, Ogdensburg, N. Y.; Richard Scannell, Omaha, Neb.; J. L. Spaulding, Peoria, Ill.; E. F. Pendergast, Philadelphia, Pa.; R. Phelan, Pittsburg, Pa.; S. A. Healy, Portland, Me.; M. Harkins, Providence, R. I.; A. Van de Vyver, Richmond, Va.; B. J. McQuaid, Rochester, N. Y.; John Moore, St. Augustine, Fla.; James Trobec, St. Cloud, Minn.; M. F. Burke, St. Joseph, Missouri; Thomas Grace, Sacramento, Cal.; Lawrence Scanlan, Salt Lake City, Utah; J. A. Forrest, San Antonio, Texas; Thomas A. Becker, Savannah, Ga.; William O'Hara, Scranton, Pa.; Thomas O'Gorman, Sioux Falls, S. Dakota; Thomas D. Beaven, Springfield, Mass.; P. A. Ludden, Syracuse, N. Y.; James A. McFaul, Trenton, N. J.; P. Bourgade, Tucson, Arizona; Alexander Christie, Vancouver, Washington; P. J. Donahue, Wheeling, W. Va.; J. J. Hennessy, Wichita, Kan.;

John J. Monaghan, Wilmington, Del.; Leo Haid, Wilmington, N. C.; and Joseph B. Cotter, Winona, Minn.

ROMAN FORUM. See ARCHÆOLOGY (paragraph Italy).

ROMERO, Don MATIAS, Mexican Ambassador to the United States, died in Washington, D. C., December 30, 1898. He was born in Oaxaca, Mexico, February 24, 1837; was educated in his native city and in the City of Mexico, receiving there a diploma in law. He entered the foreign office in 1855 and two years later, when Comonfort compelled President Juarez to leave the capital, Romero accompanied the latter to Vera Cruz. He came to Washington in December, 1859, as First Secretary of the Mexican legation, becoming Charge d'Affaires in the absence of the Minister in August, 1860. Returning to Mexico in 1863 he participated in the war against the French, being appointed colonel by President Juarez and becoming chief of staff to General Porfirio Diaz. In the latter part of the year, however, he went again to Washington, as minister, remaining until 1868, when, in his own government, he became Secretary of the Treasury. On account of ill health he retired in 1872, but in 1877-78 was again Secretary of the Treasury, and in 1880 served as Postmaster-General. In March, 1882, he returned to Washington as minister and remained in that position until 1898, with the exception of ten months, in 1892, when he was again called to the portfolio of the treasury. Early in December 1898, the Mexican government advanced Minister Romero to the rank of ambassador. Señor Romero was recognized as a man of great ability and his strong influence was always used toward bringing about closer and more friendly relations between the American republics, and especially between Mexico and the United States. In the fall of 1898 he published a large work entitled *Mexico and the United States*; the book deals with the political, industrial, and social relations of the two countries, and is probably the best work on present conditions in Mexico. See MEXICO (paragraph Romero's "Mexico.")

ROMULUS, TOMB OF. See ARCHÆOLOGY (paragraph Italy).

ROOSEVELT, THEODORE, Governor of New York, was born in New York City, October 27, 1858. After his graduation from Harvard, in 1880, he passed some time in European travel and Alpine climbing, and on his return began the study of law, but in 1881 was sent to the State Assembly and was returned in 1883, 1884 and 1885. He introduced important reform measures and his entire legislative career was made conspicuous by the courage and zeal with which he assailed political abuses. He was a delegate to the national Republican convention, at Chicago, in 1884, and, though he opposed the nomination of James G. Blaine, he refused to join the Republican Independents in supporting Mr. Cleveland. In 1886 Mr. Roosevelt was the Republican candidate for Mayor of New York against Mr. Henry George (Labor), and Mr. Abram S. Hewitt (Democrat); the last named was elected by a plurality of about 22,000. In 1884 he established a ranch in Montana and for a number of years subsequent passed his summers there in hunting; in this way he acquired a wide and accurate knowledge of life among the cowboys and hunters. The amount of his literary work is remarkable for a man whose attention has been given so largely to other matters. His publications, which are chiefly historical and political, amount to about ten volumes. Among them are *The Naval War of 1812* (1885); *Hunting Trips of a Ranchman* (1885); *New York* (1891); *The Wilderness Hunter* (1893). His works are characterized by vigor of thought and clearness of expression.

In 1888 Mr. Roosevelt was appointed a Republican member of the United States Civil Service Commission, which position he filled with great ability and strict integrity until he resigned, May 1, 1895, to accept the appointment by Mayor Strong to the position of President of the Board of Police Commissioners of New York City. Through his admirable fearlessness and administrative power, the demoralized police force was greatly improved. This position, also, he resigned in 1897 to become Assistant Secretary of the Navy, and it is said that his influence and energy had much to do with the speedy equipment of the navy in 1898. After the outbreak of the Spanish-American War his patriotism and love of active life led him to resign his portfolio and enter the volunteer army. As a lieutenant-colonel of volunteers, he recruited the First Volunteer Cavalry, the regiment popularly known as the Rough Riders. The men were recruited largely from the cowboys of the far West and Southwest, but there were also many young college-bred Easterners and young men of high social standing, anxious to see service, who joined the regiment. Since no horses were transported to Cuba, this regiment, along with the rest of the cavalry, was obliged to serve on foot. Colonel (afterwards General) Leonard Wood was first in command, but was succeeded by Lieutenant-Colonel Roosevelt, who was promoted to the colonelcy. The regiment distinguished itself in the Santiago campaign, and Colonel Roosevelt became famous for his bravery in leading the charge up the San Juan Hill in the fight of July 1. He was an efficient officer and won the love and admiration of his men. On August 3, Major-General William R. Shafter, commanding



GOVERNOR THEODORE ROOSEVELT.

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Bragg, by whom he was afterward defeated, after a brilliant defense, at Chickamauga and Chattanooga. Soon after he was succeeded by General Thomas, pending the arrival of General Grant; and it was in 1864 that he took command of the Department of the Missouri. He resigned from the army in 1867, being mustered out with the rank of brevet major-general; was minister to Mexico, 1868-69, where he became interested in railway construction and projects; was a Democratic member of Congress from California, 1881-85, and during the next eight years was Register of the United States Treasury. "Notwithstanding some faults of temper and military vacillation, General Rosecrans was undoubtedly a splendid fighter and a good strategist. The discredit thrown upon him by his removal from command was in a measure removed by the action of Congress in 1889, restoring him to full rank and pay as brigadier-general and putting him on the retired list."

ROSS, General LAWRENCE SULLIVAN, ex-Governor of Texas, died at College Station, Texas, January 4, 1898. He was born at Bentonsport, Iowa, September 27, 1838; was graduated at an institution in Florence, Alabama, in 1858, and the next year served on the Texas frontier against the Comanches, becoming major commanding the Texas Frontier Battalion. He entered the Confederate service in 1861 and served through the war, rising to the rank of brigadier-general. He was wounded several times and is said to have taken part in 135 engagements. General Ross was elected sheriff of McLennan county, Texas, in 1873, a Democratic member of the constitutional convention in 1875, and State Senator in 1881. He was Governor of his State in 1887-89. General Ross was president of the Agricultural and Mechanical College, College Station, Texas.

ROSTAND, EDMOND, a French poet and dramatist, born at Marseilles, in the year 1868. After publishing a volume of verse, *Les Musardises*, Rostand made his first attempt at dramatic composition in the shape of a three-act comedy in verse, *Les Romanesques*, which was brought out at the Comédie Française in 1894, and met with a favorable reception. This was followed by a four-act drama, *La Princesse Loiraine*, and by *La Samaritaine*, described as an "Evangile en Trois Tableaux," both written in verse and both produced at the Théâtre de la Renaissance, in 1896 and 1897 respectively. His reputation as a dramatist was now established, and yet there was in his previous work small prophecy of the ovation which greeted his next play, the now famous *Cyrano de Bergerac*, first produced in Paris at the Théâtre de la Porte Saint-Martin, on December 28th, 1897. French critics, even the more conservative were almost unanimous in recognizing that a new star had risen in the firmament of French letters. Even Jules Lemaitre, who formerly censured *La Samaritaine* for "the Provençal and even Neapolitan flavor of its supple and highly colored verse," pronounced *Cyrano* "delicious," and its verse "sparkling with joy;" while Emile Faguet declared it "the finest dramatic poem that has appeared for half a century," adding that "absolutely anything may be expected from a poet who at the age of twenty-nine opens the twentieth century in such a splendid and triumphal manner." It is really the quality of the verse, fantastic, exuberant and at times almost Rabelaisian, rather than the plot, to which the success of *Cyrano* is mainly due: for the story of the play, when re-told in plain, every-day prose, admirable as it is, is scarcely such as to suggest a masterpiece. As is now generally known, thanks to a recent volume by Pierre A. Brun (*Souvenirs de Cyrano de Bergerac, sa Vie et ses Oeuvres, d'après des Documents Inédits*), the real Cyrano of history was a person with a threadbare coat, a pretty cousin and a monumental nose; and he was equally quick to resent a sarcastic allusion to any one of them. And these facts have been utilized by M. Rostand with admirable skill. The play opens at the theatre of the Hotel de Bourgogne, where Cyrano, in his capacity as one of the "Cadets de Gascogne," and the most Gascon of them all, has forbidden the actor Montfleury to appear on the stage for a whole month, as a penalty for having looked too long at the pretty cousin, Roxane, whom Cyrano secretly loves. Unfortunately, however, Roxane loves another, Christian de Neuville, a newcomer among the Cadets de Gascogne; and this preference she owns to Cyrano, begging him to save Christian from the cruel annoyances which the Cadets reserve for new recruits, when they happen to come from the north of France. The request is timely, for the Cadets have incited Christian to taunt Cyrano regarding the size of his nose, a proceeding calculated to end disastrously; instead, however, the two become fast friends, Christian owning his love for Roxane, while Cyrano guards his own secret and promises to aid his rival. Unfortunately Christian is a man more eloquent with his sword than with his tongue, while Roxane is a true representative of the "precieuse" type of that period, and is not satisfied to be wooed with a plain blunt "I love you." So Cyrano becomes the mouthpiece for Christian's passion, composing his love-letters for him, and in the great balcony scene,—a scene which has been called the finest in French dramatic art,—he pleads the latter's cause directly, under the cloak of night and in a disguised voice; and he remains below in hiding, while Christian scales the balcony to receive the tender reward of his spokesman's eloquence:

"Kiss, feast of love where I am Lazarus,
There reach me in the dark some crumbs from thee;
But still I feel my heart has something gained
Since on these lips where Roxane now is caught
It is the words I spoke just now she kisses."

Their happiness, however, is short-lived; the company of Cadets de Gascogne are sent to the siege of Arras, and are most of them massacred, Christian among the number, leaving Roxane to treasure the illusion that he was as brilliant as he was courageous; and Cyrano, loyal to his friend, does not enlighten her. Roxane retires to a convent, and here for fourteen years Cyrano comes each Saturday evening to talk with her. And one night he comes late, for the first time in fourteen years, for he has received a fatal blow upon the head and knows that he is dying; here he talks for the last time to the woman he has loved so long, and in the gathering dusk reads aloud her last letter from Christian, which he himself wrote on the battlefield at Arras; and as he reads on in the darkness, with the eyes of memory, the truth suddenly dawns upon her, and he dies in the happiness of knowing that she knows and understands.

As a consequence of its great popularity, *Cyrano* has been published in this country in numerous translations. Among the more important may be mentioned those of Howard Thayer Kingsbury (the version used by Richard Mansfield), of Gertrude Hall; and of Gladys Thomas and Mary F. Guillemard.

ROTHSCHILD, Baron FERDINAND JAMES DE, second son of the late Baron Anselm de Rothschild, of Vienna, was born in 1839, and died in London, December 17, 1898. He was a banker by profession, was a Liberal Unionist Member of Parliament for Bucks. Aylesbury Division, from 1885 to the time of his death. In memory of his wife he founded the Evelina Hospital, Southwark Bridge Road.

ROUGH RIDERS' ASSOCIATION, formed before disbanding, by the First Regiment U. S. Volunteer Cavalry, serving in Cuba in 1898. All members of the regiment are eligible and the membership will descend to the oldest sons of original members, and be continued as in the Order of the Cincinnati (q. v.). Officers: Lieutenant-Colonel Alexander O. Brodie, President; Colonel Theodore Roosevelt and Brigadier-General Leonard Wood, Vice-Presidents, and Lieutenant T. D. Carter, Secretary and Treasurer.

ROYAL ACADEMY EXHIBITION. See PAINTING (paragraph Exhibitions).

ROYAL ACADEMY, LONDON, (BURLINGTON HOUSE, PICCADILLY) founded by George III in 1786. It was removed from Somerset House to Trafalgar Square in 1834, and to its present abode in 1869. Its objects are the maintenance of a school or academy of design for the gratuitous instruction of students, and the holding and annual exhibition for artists of distinguished merit. The first president was Sir Joshua Reynolds. An annual banquet of much interest to the artistic world is held. The winter exhibition in connection with the Royal Academy was established in 1869. The society consists of 40 Royal Academicians and 30 Associates. Academicians: Sir Edward John Poynter, President; Ernest Crofts, R. A., Keeper; Alfred Waterhouse, Treasurer; William F. Yeames, Librarian. George Aitchinson, L. Alma-Tadema, H. H. Armstead, Thomas Brock, G. H. Boughton, H. W. B. Davis, Frank Dicksee, S. Luke Fildes, E. Onslow Ford, Alfred Gilbert, Frederick Goodall, Andrew C. Gow, Peter Graham, Edward J. Gregory, Hubert Hirkomer, James C. Hook, T. G. Jackson, B. W. Leader, G. D. Leslie, John S. Lucas, John MacWhirter, W. Q. Orchardson, W. W. Ouless, Val. C. Prinsep, Sir W. B. Richmond, Briton Riviere, James Sant, John S. Sargent, R. N. Shaw, Marcus Stone, W. H. Thorneycraft, J. W. Waterhouse, H. T. Wells and Henry Woods.

ROYAL ACADEMY OF VIENNA, founded by the Emperor Ferdinand I in 1846, although it was projected by Leibnitz. It is divided into two classes; mathematics and science, and history and philology. There are 60 ordinary members, 24 honorary members, and 120 correspondents. Since 1850 it has published important memoirs. The first president was the celebrated orientalist, Hammer-Purgstall.

ROYAL ARCH MASONS have 44 chapters (besides 18 subordinate chapters in the territories, the Hawaiian Islands, China and Chile), and 177,628 members. Its next triennial meeting will take place in Cincinnati, September, 1900. General Grand High Priest, Reuben C. Lemmon, Toledo; General Grand Secretary, Christopher I. Fox, Buffalo.

ROYAL ASIATIC SOCIETY, of Great Britain, was founded in London in 1823 by several noblemen and gentlemen, for the study of arts, sciences and literature relating to Asia.

The transactions of this society contain important essays on eastern literature, religion, philosophy, art, etc. The Asiatic societies of Ceylon and China, at Hong Kong, as well as the Literary Society of Bombay and Madras, are considered branches. Lord Reay, President; Prof. T. W. Rhys-Davids, Secretary.

ROYAL COLLEGE OF ART (South Kensington), established to train art masters and mistresses as well as students in drawing, painting, modelling and architecture, designing and decoration. Sir W. B. Richmond and F. J. Shields, Visitors; J. C. L. Sparks, Principal, and J. A. Grant, Registrar.

ROYAL INSTITUTE OF PAINTERS IN WATER COLORS, founded in 1831. President, James D. Linton; Vice-President, E. M. Wimperis; Secretary, W. T. Blackmore. The society exhibits at its headquarters, 189 Piccadilly, London.

ROYAL ORDER OF SCOTLAND, holds its charter from the Grand Lodge of the Royal Order of Scotland, Edinburgh, and was organized in 1878 with Albert Pike as Provincial Grand Master. It has no subordinate bodies; membership, 291. Officers of the Provincial Grand Lodge for the U. S. of America: Provincial Grand Master, Josiah H. Drummond, Portland, Me.; Provincial Grand Secretary, W. Oscar Roome, Washington, D. C.

ROYAL SCOTTISH ACADEMY, Edinburgh, instituted, 1826; incorporated, 1838; consists of three orders: Academicians, Associates and honorary members. Each member is entitled to exhibit five works. Sir George Reid, President, and George Hay, Secretary.

ROYAL SOCIETY, LONDON, Burlington House, founded in 1660 for the pursuit of science. Charles II granted the charter in 1662, which was followed by a second charter in 1663. The library contains 50,000 volumes. The meetings are held weekly and the society awards the Copley, Rumford, two Royal, Davv. Darwin, and Buchanan medals. The Buchanan is given quinquennially, the Rumford and Darwin biennially, and the others annually. The Copley is the most highly prized. This was given to Sir William Huggins in 1898. The President is Lord Lister. There are 450 fellows and 50 foreign members. The fellows elected in 1898 were: Henry Frederick Baker, Ernest William Brown, Dr. Alexander Buchan, Sidney Frederick Harmer; Arthur Lister, Lieutenant-General Charles Alexander McMahon, William Osler, Charles A. Parsons, Thomas Preston, Edward Waymouth Reid, Alexander Scott, Albert Charles Seward, William Ashwell Shenstone, Henry Martyn Taylor, and James Wimshurst. Prof. M. Foster and Prof. A. W. Rücker are the Secretaries.

ROYAL SOCIETY OF PAINTER ETCHERS, founded by Sir Francis Seymour Haden in 1881, who states that "the purpose of this society is not merely the restoration of original etchings, but the re-infusion into all forms of engravers' work, of those personal qualities which, whatever the process employed, in the hands of the great masters of painting made engraving a fine art." The exhibitions are held at the gallery in Pall Mall every spring.

ROYAL SOCIETY OF PAINTERS IN WATER-COLORS (London), founded in 1804, since which time it has held annual exhibitions. The number of members is limited to 40; the number of associate exhibitors is unlimited. President, E. A. Waterlow; Secretary, Percy Edsall.

ROYAL TEMPLARS OF TEMPERANCE, a fraternal society, organized in 1870, consists of 9 grand councils, 527 select councils, and 22,317 members. Benefits disbursed since 1870 were \$7,255,809, during last fiscal year, \$383,750. Supreme Councillor, L. R. Sanborn, Buffalo; Supreme Secretary, E. B. Rew, Buffalo.

RUNAWAY STARS. See ASTRONOMICAL PROGRESS.

RUSKIN SOCIETY OF LONDON (Society of the Rose), established in 1881. Public readings, papers and addresses in exposition of Ruskin's works are features of its meetings. J. T. Smart, Secretary.

RUSSELL, WILLIAM CLARK, author, born in New York, February 24, 1844. He is the son of Henry Russell, a favorite English concert singer in New York between 1833-1845 and composer of songs. From the age of thirteen to twenty young Russell was in the British Merchant service. His stories are all of the sea and are popular. They include: *John Holdsworth, Chief Mate* (1875); *Wreck of the Grosvenor* (1876); *A Sailor's Sweetheart* (1877); *The Frozen Pirate* (1877); *An Ocean Tragedy* (1881); *The Convict Ship* (1895); *What Cheer* (1895); *A Noble Haul* (1897); and *The Romance of a Midshipman* (1898). He published a biography of Lord Nelson in 1897.

RUSSIA, EMPIRE OF, comprising northern Europe and all of northern Asia. has an area of 8,660,394 sq. m., with a population in 1897 of 126,411,000, of which the fifty governments of European Russia comprised 94,215,000.

Movement of Population.—The population nearly doubled between 1851 and 1897. The above figures of population differ somewhat from those which were published in the United States in 1897, but the latter were founded upon preliminary accounts and the present figures are based upon carefully revised reports which became accessible in 1898. Of the total population of the Empire 63,253,000 were males and 53,158,000 females. The census of 1897 was the first general census that was ever taken in Russia; it is therefore impossible to compare the relative growth of the urban and

rural population, but it is a significant fact that, according to the census of 1897 the population of the towns of Russia represented about 13 per cent. of the total population. If, however, villages and small settlements be included with the towns, the town population would be about 20 per cent. Some interesting conclusions concerning the increase of population in Russia, based on the census of 1897 were published in a French periodical in 1898. Although the density, according to that census, was only 51 inhabitants per sq. m. in European Russia, as compared with 183 in France, 235 in Germany, 316 in England and 518 in Belgium, there are signs that this difference in density is rapidly decreasing. In the more settled districts a far higher average of density is reached. For instance, it is 194 in Poland and from 90 to 114 in Muscovy. St. Petersburg, with 1,267,000 inhabitants, appears to be on the increase, but is likely to be surpassed in the rapidity of its growth by Moscow, which had 988,000, and by other cities which are not situated in what is now regarded as the kernel of the Empire. In fact it is held by this writer that the kernel of the Empire is losing its relative importance, for while the population in Central Russia has increased 20 per cent., that of outlying regions has increased from 40 per cent. to 60 per cent. The centre of gravity seems to be moving toward the south and east, and St. Petersburg cannot be regarded as the centre of population. An enormous mass of the population moves into the less settled regions each year. For instance, it is said that during the first ten months of 1896, 196,000 immigrants arrived in Siberia. The Cossack region is also gaining rapidly, having increased to the extent of 2,500,000 in the two years preceding 1897. This movement is interesting in connection with the view of certain writers that the time may come when Poland, Lithuania, the Cossack region, and Muscovy will separate from the region of St. Petersburg as the natural centre and form a federated state. As to the increase of the population in general this writer estimates that in 1724 there were only 16,000,000 Russians; in 1762, 20,000,000, in 1796, 37,000,000 in 1809, 46,000,000, and in 1897, 130,000,000. Part of this increase is, of course, accounted for by the incorporation of new territories.

Postal and Telegraph Systems.—In 1895 there were forwarded by the internal service 271,286,000 letters and postal cards, 16,545,000 letters with money, and 202,420 periodicals and packages. In 1895 there were 78,396 miles of telegraph line and 157,397 miles of wire. The state owned nineteen-twentieths of the entire system.

Industry and Commerce.—A systematic presentation of statistics of industry and commerce for the year 1898 is impossible at the present date, but some interesting facts are presented in the reports from American Consuls during that year. Foreign capital has sought investment in Russia in increasing amounts in recent years, and at the close of 1897, \$65,000,000 was considered a low estimate of the amounts invested there. Although native industries have advanced, Russia is still an excellent market for the manufactures of other countries. The Germans have been especially skillful in taking advantage of this fact, and large numbers of German commercial agents are quartered in Russia. As a result they sell more goods there than the merchants of any other nation on the continent. Germany has natural advantages in situation and means of transportation, as well as in the fact that many of the Russian merchants speak the German language. The progress of the petroleum trade in the past few years has been remarkable. The centre of production is Baku, and it was estimated in 1897 that the average daily production of crude oil was about 139,000 barrels larger than it ever had been before. Foreign capital has sought investment here, resulting in a considerable rise of prices. It has been planned to build a pipe line for refined oil, from Baku to Batum, a point about 415 miles to the west. Iron is another natural product whose output has greatly increased in recent years. During 1897 the increase was so rapid that Russia, which ten years before held the seventh place among iron-producing countries, was advanced to the fifth place. It was estimated that during the year Russia had produced 2,043,000 tons, an increase of 15 per cent. over the previous year. The production in the Ural mountain regions has increased with especial rapidity, advancing 108,000 tons in 1897 as compared with the previous year. The output of iron has also increased in the Kerch peninsula in the Black Sea, and foundries have been established at Rostoff, on the River Don, and in northern Russia. The increase in consumption of iron has also been large, but in 1897, the increased production was sufficient to cover it. The government, as the owner of the principal railways, is virtually the only purchaser of steel rails. The production of cast iron has also increased decidedly in recent years, rising from 1,275,534 tons in 1893 to 2,053,422 tons in 1897. (See IRON AND STEEL and PLATINUM.) Since 1895 the production in the distilling industries has fallen off. Central Russia is the main centre of these industries, and they are very important. The leading countries receiving Russian exports in 1895 were, in the order of their importance, Germany, Great Britain, The Netherlands, France, Austria Hungary, Italy, Belgium and Turkey. and of these Germany and Great Britain took by far the largest share. The leading countries importing to Russia in the same year were, in the order of their importance, Germany,

Great Britain, United States, Austria Hungary, France, Belgium and Italy. Of all the commodities exported from Russia those grouped under the class food supplies had the greatest value, and next in importance was raw and half-manufactured material.

In imports the chief classes in respect to value were raw and half-manufactured material and fully manufactured goods. As to manufactures, Russia imported in 1895 between thirteen and fourteen times as much as she exported. In general she ranks as one of the great grain-producing countries of the world, her products in this class being wheat, oats, maize, millet, buckwheat, etc. In 1897 there was a failure of the crop in western Europe as well as in Russia. The high prices led to an increase in the exportation of all cereals from Russia, with the exception of oats, but the increase was possible, not because the producers' supplies were greater, but owing to the large stock on hand. Besides the grain crop there was a falling off in the flax and hemp crop. The American Consul-General reported in the summer of 1898 that the total harvest of flax fibre in all the governments of Russia was smaller by 31 $\frac{1}{2}$ per cent. in 1897 than the yield in 1896. There was a marked decrease in hemp also. There being no decrease in the area under cultivation, the decline in these crops was due to unfavorable conditions. The cultivation of beets, however, increased. In the spring of 1898 the area under cultivation was larger than in any previous year. See SIBERIA.

Revenue and Expenditure and National Debt.—The budget estimates for 1898 place the revenue and expenditure each at 1,474,049,923 rubles. There was a deficit of 106,000,000 rubles in external revenue, which was due for the most part to the increased outlays on the railways. The national debt of Russia on January 1, 1897, showed a total of 6,735,376,443 rubles. In 1898 it was placed at about £715,000,000, of which about £250,000,000 was spent on account of railways.

Currency.—Russia has gone steadily on in her attempts to establish the gold standard on a firm basis. The Minister of Finance, M. de Witte, who is reckoned one of the ablest financiers in Europe, submitted his budget statement on January 20, 1898. He reports that excellent results have followed from the change of the standard which has now been completely brought about. During the year the circulation of gold coins more than quadrupled and at the same time there was an increase of 109,000,000 rubles of gold in the treasury. The amount in the banks and in circulation was 1,470,000,000 in gold, 162,000,000 in silver, and 999,000,000 in notes.

In January, 1898, the Russian Financial Agent, M. de Routkowsky, attaché of the Russian legation at Washington, made a statement in regard to the reform of the currency during the year that had just closed. The principal points in this statement were as follows: Russia was formerly a single standard silver country, the monetary unit being the silver ruble, containing 18.02 grams of pure silver. Gold coins of various denominations circulated as currency, and there were state credit notes issued by the Bank of State, which was the only credit institution having the right of issue. Silver was legal tender to any amount in payment of taxes and duties to the government, and the credit notes, which were based on the entire property of the state, were also legal tender at par with silver in the payment of taxes and dues. These notes and the silver and gold coin circulated at par until the heavy expenses of the Crimean War, followed by those of the Russo-Turkish War, obliged the government to suspend the exchange of the notes for coin. The period of suspension extended for nearly forty years, and the country was placed on the basis of an inconvertible paper currency. Then came an attempt at gradual reform. The government curtailed its expenses, increased its revenues, and made good the deficit in the state budget. Fifteen years of this policy resulted in the accumulation of a large quantity of gold, obtained partly through foreign loans, and the result was so to improve the national currency that at the end of fifteen years gold could be borrowed for 3.2 per cent, instead of 6 per cent., which was the former rate. This done, the government determined to rid the country of its inconvertible paper. The gold ruble was definitely established as the new unit of currency in 1897. It should contain .7742 grams of pure gold, equal to 51.45 cents in United States gold. The silver ruble had declined from 100 copecks, gold value, to 45 copecks, and the credit notes from 100 to 66 $\frac{2}{3}$. Silver had not only declined but was liable to frequent fluctuations, and the government considered it unfit for a monetary standard. As to the State Bank of Russia it still remains the only credit institution with the right to issue state credit notes, and it may still issue such notes for an unlimited amount. These notes are legal tender. To the value of 600,000,000 rubles they may be issued on the basis of 300,000,000 rubles of gold deposits, but if the amount of issue exceeds 600,000,000 rubles, such excess must be guaranteed to the full amount in gold. On December 5, 1897, the amount of outstanding state credit notes in banks and in circulation, was 1,068,000,000, and the amount of gold in coin and in bank was 1,160,000,000. Silver is retained in the currency as a subsidiary metal for the minor coins, and the laws of 1897 made no change in its character as legal tender in the payment of taxes and dues to the gov-

ernment, although between private individuals it is not legal tender to an unlimited amount. A new law went into operation on March 31, 1898, making silver currency a legal tender for payment of government dues and taxes to an unlimited amount with the exception of customs dues; while in transactions between private individuals silver is legal tender only to the amount of 25 rubles. The same law limits the coinage of silver to three rubles per capita.

The Russian Financial Agent gives the amount of gold and silver coins in the Imperial Bank and in circulation on January 1, 1898, as follows:

	Gold.	Silver.
Imperial Bank	1,315,000,000	63,000,000
Circulation	155,000,000	99,000,000
Total	1,470,000,000	162,000,000

Apparently Russia is out of her financial difficulties. The annual report of the director of the United States Mint shows from what countries Russia has derived her present gold supply. On July 1, 1898, he showed that the Russian treasury held over \$70,000,000 of United States gold coin, \$50,000,000 in English sovereigns, \$27,000,000 of German gold coins and \$15,000,000 in francs.

Army.—The Russian army consists of the active army, the first reserve and the second reserve. The period of service in the active army of European Russia is five years, in the first reserve three years, and in the second reserve five years. In 1896 there were 987,917 men liable to military service, but of these 77,542 were found unfit and 30,585 did not appear. In 1898 the war strength was about 2,500,000 men, but besides this there was an available reserve of 1,064,000, frontier battalions numbering 41,000, Cossacks numbering 142,000, territorial reserves numbering about 2,000,000 and a national militia numbering about 1,200,000. A great part of this force, however, is available only in emergency and on account of the great distances to be covered and the difficulty of mobilization is not to be reckoned at its full strength. In 1898 two new army corps were created and a new independent cavalry brigade was formed. The peace strength of the army in Europe and the Caucasus was given as 768,000 men, of whom 497,000 were infantry, 109,000 cavalry and 107,000 artillery, and the number of troops stationed elsewhere was given as 92,000, of whom 66,000 were infantry, 10,000 cavalry and 8,000 artillery. Strong forces were massed on the frontiers toward Germany and Austria and in the Caucasus; and the military commands in Asia were considerably strengthened. The military budget estimates for 1898 were 288,888,664 rubles, which showed a considerable increase over 1896.

Railways.—In September, 1897, the mileage in operation was 26,211, while upwards of 7,700 miles were in process of construction. Some account of the Trans-Siberian Railway is given in the following paragraphs on history.

HISTORY.

An account of Russia's Chinese policy and its results in 1898 will be found in the article CHINA (q. v.).

Internal Affairs.—Early in the year 1898 the government made earnest efforts to promote the merchant marine. Plans for a ship canal to connect the Baltic with the Black Sea were said to have been perfected. On May 27, 1898, it was provided that ships purchased for foreign trade should be admitted free of duty and the duty on ships intended for internal trade was greatly reduced. The events in China seemed to demand an increase in the navy, and in March a considerable expenditure was ordered for that purpose. In the summer of 1898 90,000,000 rubles were appropriated for new warships; work on several new vessels was begun and one powerful battleship was launched. As to the general condition of the people, the consequences of the failure of the crops in 1897 were discernible early in 1898. In parts of the empire there was serious scarcity. In the summer of 1898 agriculture was checked by a long period of drought and towards the end of September it was reported that the crops in southern Russia were not up to the average, and that in northern and central Russia they had completely failed.

The American Consul-General at St. Petersburg, writing under date of August 18, 1898, submitted some reports on the Russian famine. It was said in these reports that the failure of the crop of cereals in 1897, in some localities, had not resulted in what could properly be called a famine, for there had been no cases of death from hunger during the year and no epidemic of typhoid fever. Still the peasantry were in a bad condition, their case being made worse by the rapid increase of the population, the small parcels of land in the possession of each family and the ignorance of the proper methods of cultivation. It was said that owing to these and more deep-seated causes, such as the lack of forests and the exhaustion of the soil, the prosperity of the Russian peasantry was on the decline. In Kazan it was reported that seven districts

were wholly without bread and without fodder. This latter circumstance brought especial hardship to the peasant by the loss of cattle and horses.

Relief measures were adopted by the Red Cross Society and the government came to the rescue by a law reducing the duty on agricultural machinery and abolishing it on fertilizers. A Commission of Inquiry was appointed to investigate the conditions in the districts threatened with famine and reported that herbage and grain were totally lacking. The authorities took steps to make it certain that the rural districts would be provisioned and supplied with seed for the fields. The suffering was most severe in the province of Kazan, where the cattle died off for lack of proper food and horses and oxen were sold for one-half or one-third of what would have been received for them at favorable seasons. As the year advanced the distress seemed to deepen. At the beginning of October it was reported that great distress in the northern and central provinces was likely to ensue as the result of the total failure of the crops.

Though externally at peace, the Empire suffered from occasional disturbances within its borders. In the province of Ferghana, Turkistan, a Russian garrison was attacked by the natives at Andijan on May 30, and a number of soldiers were killed. The revolt was put down with severity; the ringleaders were hanged and a large number of the rebels were sentenced to the same punishment, but most of them were afterwards reprieved and sent to Siberia. The cause of the outbreak was said to have been the fanatical hatred of Russian rule which had been developing in that region for several years. The native administrators who had assumed offices which were formerly held by Russians were said to have abused their power, and to have robbed the people at every point. Order was not maintained and brigandage increased. The discontent of the people under these conditions was, it is said, fomented by secret agents from India, who tried to stir up Mohammedan fanaticism against the Russians. There were signs of coming danger in 1896 and 1897, when marauding bands traversed the country and when two Russian officers were murdered. But this account of the matter, which points evidently to British instigation as one of the causes of the revolt, has not any official sanction, and may not be entirely correct. At St. Petersburg it was declared that the revolt was due wholly to religious fanaticisms and especially to the resentment of the Mohammedan priests, who had been deprived of certain immunities, including exemption from taxation, and who were excited by a Mohammedan revival, resulting from the victory of the Turks over the Greeks. The leader of the forces that attacked the Russian post was Ishan Mahomed Ali Khalif, who was captured and executed.

The Trans-Siberian Railway.—The Trans-Siberian Railway was pushed on energetically during the year 1898 and it was said that it would be completed in 1904. In 1891 there was a railway from St. Petersburg to Tcheliabinsk, a distance of 1,300 miles, while the total length of the route between St. Petersburg and Vladivostock was 6,000 miles. In 1898 there were between 1,300 and 1,400 miles of track in operation in western Siberia. The work was being carried on simultaneously in several sections, the two large sections including the line between Moscow and Irkutsk, and between Irkutsk and Vladivostock. It was expected in 1898 that the entire line between Moscow and Vladivostock would be opened by rail and steamer in 1900. It was said in 1898 that the Russian government had planned to expend 50,000,000 rubles on the line in the next four years. By a treaty with China, Russia secured the right of carrying the railway into central Manchuria and from both directions, viz: from a point in Siberia and from Vladivostock; and to build a line from this point in central Manchuria to Port Arthur, unless China undertook to build such a line herself. This gave Russia the opportunity of opening communication with an important commercial railway, to shorten the route and to avoid certain engineering difficulties. The proximity of Port Arthur makes it possible for Russia to provision quickly the military forces which she may station on the Asiatic coast.

The Czar's Peace Proposal.—On August 24 Nicholas II of Russia caused a note to be sent to the foreign diplomats at St. Petersburg, urging the necessity of a convention for discussing the maintenance of peace and the disarmament of the nations. This peace proposal caused a great stir throughout Europe and America. The text of the circular which was handed to the foreign diplomats by Count Muravieff is as follows:

"The maintenance of general peace and the possible reduction of the excessive armaments which weigh upon all nations present themselves in existing conditions to the whole world as an ideal toward which the endeavors of all governments should be directed. The humanitarian and magnanimous ideas of his majesty the emperor, my august master, have been won over to this view in the conviction that this lofty aim is in conformity with the most essential interests and legitimate views of all the powers; and the imperial government thinks the present moment would be very favorable to seeking the means. International discussion is the most effectual means of insuring all people's benefit—a real durable peace, above all, putting an end to the



(By courtesy of *Review of Reviews*.)

NICHOLAS II. CZAR OF RUSSIA.

progressive development of the present armaments. In the course of the last twenty years the longing for general appeasement has grown especially pronounced in the consciences of civilized nations, and the preservation of peace has been put forward as an object of international policy. It is in its name that great states have concluded between themselves powerful alliances.

"It is the better to guarantee peace that they have developed in proportions hitherto unprecedented their military forces and still continue to increase them without shrinking from any sacrifice. Nevertheless, all these efforts have not yet been able to bring about the beneficent result desired—pacification. The financial charges following the upward march strike at the very root of public prosperity. The intellectual and physical strength of the nations' labor and capital are mostly diverted from their natural application and are unproductively consumed. Hundreds of millions are devoted to acquiring terrible engines of destruction, which, though to-day regarded as the last word of science, are destined to-morrow to lose all their value in consequence of some fresh discovery in the same field. National culture, economic progress, and the production of wealth are either paralyzed or checked in development. Moreover, in proportion as the armaments of each power increase, they less and less fulfill the object the government has set before themselves.

"The economic crisis, due in great part to the system of armament *à l'outrance* and the continual danger which lies in this massing of war material are transforming the armed peace of our days into a crushing burden which the peoples have more and more difficulty in bearing. It appears evident that if this state of things were to be prolonged it would inevitably lead to the very cataclysm it is desired to avert, and the horrors whereof make every thinking being shudder in advance. To put an end to these incessant armaments and to seek the means of warding off the calamities which are threatening the whole world—such is the supreme duty to-day imposed upon all states. Filled with this idea, his majesty has been pleased to command me to propose to all the governments whose representatives are accredited to the imperial court the assembling of a conference which shall occupy itself with this grave problem.

"This conference will be by the help of God, a happy presage for the century which is about to open. It would converge into one powerful focus the efforts of all states sincerely seeking to make the great conception of universal peace triumph over the elements of trouble and discord, and it would, at the same time, cement their agreement by a corporate consecration of the principles of equity and right, whereon rest the security of states and the welfare of peoples."

So radical a proposal seemed to be received with considerable scepticism, yet on the whole the published comment was favorable and regarded the Czar's note seriously. The Russian press was of course favorable. The comment of the British press was cordial, but by no means hopeful. It was declared that England would support the Czar in his humanitarian designs to the best of her ability and his sincerity in the matter was not called into question for a moment. Some papers in Germany adopted a rather cynical tone in speaking of the matter, stating that there was nothing in Russia's political history to lead other nations to place much trust in her disinterestedness, and as one paper phrased it, Germany "will guard the Czar's peace proposition as far as possible, but will have to keep her powder dry." The country that took the least favorable view of the Czar's proposition was naturally France. The Russian-French alliance would have no meaning to the French people if there were to be universal peace with the Alsace-Lorraine question still unsettled; yet it was stated in some quarters that the Alsace-Lorraine question would be settled on some basis favorable to France and the neutralization of that territory was mentioned as possible. There was an ill-disguised spirit of hostility in the comments of many of the French newspapers. The Czar's proposition was considered a dream which would never be realized. It was urged that the nations of Europe would range themselves on this question according as they had or had not profited during recent years. Those which had suffered humiliations would of course be opposed to peace, whereas those who had gained territory would naturally desire to maintain the territorial *status quo*. Russia's gains were undeniable. Russia was therefore for peace. France would lose by the adoption of such a policy. The minor powers of Europe on the whole said little about the proposal.

As time went on a great diversity of opinion in regard to the Czar's Message became apparent. The leading magazines in Great Britain showed a tendency to take a rather cynical view of the subject, although they generally inclined to a belief in the Czar's sincerity. In some quarters the object which the Czar had in view was not even regarded as desirable. It was said that the present armament was by no means a curse, for without it the civilized world would have no protection against barbarism. One writer declared that "it would be a crime against humanity to hold all the precious gifts that Latin, Celtic and Teutonic civilization has given to the world, at the mercy of the Slavonic or Asiatic hordes." It was said that during the time

when the armament of the leading nations of Europe had been most complete peace had been maintained. Among the great powers of the world there had been peace for twenty-seven years, an unusually long period for the cessation of hostilities. In reply to the economic argument based on the vast expense of militarism, it was said that while the reduction of military and naval expenses might tend to promote internal prosperity, there would always be the danger of injury from without. And after all the main problem in economic matters was that of the diffusion rather than the increase of wealth. Nor was it fair to hold the system of heavy armaments responsible for the poverty of nations. Such countries as Russia, Italy and Spain owe their poverty, it was held, to other causes. They would be poor even if they had not to bear this burden. On the other hand, the necessities of constant warlike preparation had not seemed to stay the economic advance of either Germany or Great Britain. The "blood tax," which was often so severely criticised in Germany, had not prevented that country from making extraordinary strides in commerce and industry. Something, too, must be said on behalf of the training which the system of conscription gives to the individual. Some writers have held that the alertness and precision fostered by military discipline have been to some extent the cause of the recent success of German artisans. If then the armed peace does not lead to war, and if it really gives an admirable training to the individual, what becomes of the main arguments on behalf of the Czar's scheme? These were some of the points urged against the Czar's proposal, although of course they represent a rather extreme view of the evils which would result from its adoption. Other writers, while believing disarmament to be most desirable, regarded the Czar's scheme as wholly visionary. They did not question his sincerity, but they did believe that clever and unscrupulous Russian statesmen had taken advantage of his dreamy philanthropy in order to further selfish national aims. Those who held these views urged that Russia needed ten years of peace. During the next ten years she had much to fear from war. She wished to push her railroads through Persia toward Afghanistan and from Manchuria toward China. With the approach to India and China both free she would be ready enough to throw off her hypocritical mask and act aggressively. The exponents of this view of the matter pointed to Russia's recent policy in the far East and asked if it were that of a nation filled with a disinterested desire for universal peace. To them it seemed as if she was merely trying to disarm her rivals under false pretences in order that she might seize what did not belong to her, without danger of attack. There was no question that a large number of intelligent Russians had long dreamed of a real and permanent peace as the best thing for the welfare of their country. But the official classes probably did not share this illusion. To foreigners it seemed strange that this proposal for a general decrease in the war preparations should come from Russia, whose policy in the past had been often aggressive and sometimes treacherous. It was remembered that the Czar had sent a pacific message to the Brussels Conference in 1874, and a few months later the Russian commanders were massacring the Turkomans. This view of the matter was well expressed in a poem by Rudyard Kipling called the *Truce of the Bear*, telling the story of a hunter whose blinded eyes and hideously scarred face were the result of his having, in a moment of pity, spared the life of a bear which he had brought to close quarters. It was asked why Russia did not begin to disarm herself. This menace of war of which she complained, seemed really to come through no nation in Europe except herself.

Thus the magnanimous intentions of the Czar, though generally admitted, led to harsh comment throughout Europe, even in quarters where the general object which he had in view was most cordially appreciated.

It was reported that the Czar's manifesto was largely due to the influence of a series of volumes entitled *The Coming War in Its Technical, Economical and Political Aspects* and written by M. Bliokh, a retired banker or financier living in Warsaw. These volumes form a sort of cyclopædia of war discussing all the details of military and naval equipments and warfare with the utmost minuteness. The conclusions of the author were at variance with the conservative views of the authorities and it was only by a sort of accident that the book came to the notice of the Czar. Its publication had been refused by the official censor, but the author having some influence with persons in power, appealed from this decision and brought the matter to the attention of the Czar himself. The latter on reading the book is said to have been much impressed with the facts which it set forth and he authorized its publication. The author's view was that partial disarmament was to the interest of Russia, which in his enthusiastic patriotism he declared was destined to inherit the earth. The policy which he advocated was in his opinion the best adapted to Russia's self interest. In this conclusion, as well as in the methods which he proposed for the realization of his ends, the Czar did not agree with him. But the figures showing the great expenses of the European armaments and arguments urged against the present system seem to have had great weight with the Emperor. M. Bliokh pointed out

that under modern conditions the management of large bodies of troops was becoming more and more difficult. It would soon be impossible for infantry to stand within earshot of their officers in the face of small calibre, rapid-firing guns in the hands of an enemy at a long range. He argues that modern European armies have assumed such bulk as to be unwieldy and says that no man, even if he be a Moltke, could efficiently direct such an enormous and clumsy mass of troops as the present army of one of the great powers. The size of the army does not measure the likelihood of success in a contest, since beyond a certain point mere numbers are disastrous from a military as well as an economic point of view. The author, therefore, thinks it absurd that the peoples of Europe should be systematically beggared for the purpose of maintaining and training these useless multitudes. The European states should, he thinks, reduce their armies and navies. If they were all reduced in the same proportion the advantage would be given to no one. It would in no wise affect the relative strength of nations for their relative strength does not depend upon the numbers of their armed force. These are the arguments which probably influenced the Czar. The other proposals, especially those involving ways and means and looking to the aggrandizement of Russia, have found no place in the Czar's programme. M. Bliokh, for instance, advocates a league for the maintenance of peace on the basis of the political *status quo* and he would have all questions, likely to lead to international disputes, settled by an International Court of Arbitration. Another feature of his scheme, which would hardly commend itself to the peoples of other countries than Russia, is the creation of a sort of International Star Chamber which should have final jurisdiction over the press with the right to forbid the criticism of awards of the Court of Arbitration. He shows his enthusiastic love of country by some of his political forecasts. He thinks that this international system will not long be required, for according to him, Russia will be the dominant power of the future. In a hundred years, he predicts, that European Russia alone will have 300,000,000 inhabitants, while Germany will have 80,000,000 and France 50,000,000.

RUSSIAN CHURCH. See GREEK CHURCH.

RUSSIAN LITERATURE. *History.*—Among recent historical works may be mentioned several important volumes bearing upon the subject of Russian diplomacy: *Russian Officials in Past and Present Times*, by E. Karnovich, a study of the history of Russian administration brought down to the very latest times; *The Russians in Holland*; *The Great Embassy, 1697-98*, by Venevitinov, a study of the time of Peter the Great, compiled from Russian and Dutch sources; and *Russian Diplomatic Agents in London in the Eighteenth Century*, by Prof. V. Aleksandrenko. A series of essays on the history of the Italian Renaissance, which the well-known critic, A. Volinski, has been contributing to a leading literary journal, the *Sevierni Viestnik*, also deserves mention.

Fiction and Poetry.—*The Sevierni Viestnik* ("Northern Messenger") has been the means of introducing to the public several newcomers in fiction. It is edited by a young woman, L. Gurevitch, whose interesting novel, *Table-land*, first appeared in its columns. In the same periodical was published *Malva*, by M. Gorski, a new writer, who has come from the ranks of the people and consequently excels in his presentment of types of the working class. The most important books of the year, however, are a collection of *Tales* by Anton Chekhov; *The Mirrors*, consisting of short stories and poems, by Zenaïda Gippius; and a similar collection of tales and poems, by Th. Sologub, entitled *Shadows*. In Chekhov's volume two stories deserve particular notice: *The Peasants*, which paints in sombre colors a contemporary Russian village, in all its native coarseness; and *My Life*, which contains a masterly delineation of the constraint and gloom of Russian provincial life. Madame Gippius first came into notice in 1896, with a collection of symbolic stories and poems called *New People*, which seemed to give great promise. In her new volume, *The Mirrors*, this promise has hardly been fulfilled, although some of the sketches in which she describes in a most convincing and natural manner the lives of simple, insignificant people, are admirable; as for instance, the governess overpowered by circumstances and persecuted in *The Witch*; or in *Home*, the old porter thinking, in the midst of the stifling city, of the pinewood and the freshness of the lake near his birthplace. The strong feature of Th. Sologub's volume consists of three excellent studies of child life: *The Worm*, *Shadows* and *To the Stars*. Both of these volumes contain, besides the short stories, some admirable verse. But the most notable contribution to poetry this year is undoubtedly Madame Myrrha Lokhvitskaya's new volume of dainty and melodious poems, many of which are based on Eastern fancies and legends. One Russian critic has said of her love poems, that they are "expressed in nervous, rhythmic strophes as bold as the fragments of Sappho." An interesting announcement for the year 1899 is that of a volume in commemoration of the first centenary of Alexander Pushkin, born May 26, 1799. Every Russian writer of prominence has offered to contribute, with the single exception of Tolstoi, who has a fixed aversion to writing to order.

RYE. The following table published by the United States department of Agriculture shows the acreage, production and value of rye in the United States in 1898.

States and Territories.	Acres.	Production. Bushels.	Value.
Maine	973	17,514	\$14,712
New Hampshire.....	973	17,028	12,771
Vermont	3,238	61,846	35,871
Massachusetts	8,678	144,923	91,301
Rhode Island .....	.....	.....	.....
Connecticut	14,392	259,056	155,434
New York	229,394	4,014,395	2,007,198
New Jersey	68,782	1,066,121	533,060
Pennsylvania	276,217	4,447,094	2,090,134
Delaware .....	.....	.....	.....
Maryland	26,845	389,252	210,196
Virginia	39,483	442,210	203,417
North Carolina	52,591	478,578	306,290
South Carolina	3,943	33,516	34,186
Georgia	16,637	133,096	130,434
Florida .....	.....	.....	.....
Alabama	1,959	21,745	22,832
Mississippi .....	.....	.....	.....
Louisiana .....	.....	.....	.....
Texas	4,093	49,116	34,872
Arkansas	2,112	24,077	15,650
Tennessee	13,213	138,736	73,530
West Virginia	14,073	157,618	81,961
Kentucky	26,569	345,397	189,968
Ohio	43,467	756,326	340,317
Michigan	97,948	1,498,604	644,400
Indiana	42,048	651,744	280,250
Illinois	71,459	1,057,593	465,341
Wisconsin	225,137	3,444,596	1,481,176
Minnesota	57,684	1,182,522	449,358
Iowa	61,954	1,177,126	470,850
Missouri	12,103	158,549	74,518
Kansas	109,635	1,710,306	632,813
Nebraska	58,758	1,104,650	375,581
South Dakota	2,918	48,439	16,469
North Dakota	1,632	24,480	8,813
Montana .....	.....	.....	.....
Wyoming .....	.....	.....	.....
Colorado	2,638	47,484	23,742
New Mexico .....	.....	.....	.....
Arizona .....	.....	.....	.....
Utah	3,487	67,996	31,278
Nevada .....	.....	.....	.....
Idaho .....	.....	.....	.....
Washington	2,364	42,552	24,680
Oregon	5,731	82,526	59,410
California	40,079	360,711	252,498
Oklahoma .....	.....	.....	.....
Indian Territory .....	.....	.....	.....
Total	1,643,207	25,657,522	\$11,875,350

ST. PIERRE and **MIQUELON**, a French possession being the largest of two small groups near the Newfoundland coast; area of the St. Pierre group, 10 square miles, and population about 5,700; area of the Miquelon group, 83 square miles, and population about 550. The principal town is St. Pierre. There is a governor who is assisted by a general council and municipal councils. The budget for 1897 was 463,000 francs (the franc being worth \$0.193), and the expenditure of France, according to the budget of 1898, was 302,500 francs. Imports in 1895 amounted to 8,165,792 francs, and exports to 11,188,087 francs. The foreign tonnage entering St. Pierre in 1895 amounted to 47,868 tons and the French and local tonnage to 116,774 tons. Primary instruction is free and opportunities are afforded for secondary education. The islands, being barren and rocky, are unfit for cultivation, and rocky, are unfit for codfishing is the principal industry.

SAINT-SAENS, CAMILLE, composer, born in Paris, October 9, 1835. He studied the piano under Stamaty and took a prize at the Paris Conservatoire for his fugues. In 1857 he was appointed organist at the Madeleine. He received the Legion d'Honneur in 1867, and was made *officier* in 1884. His works include: *La Princesse Janne* (1872); *Samson et Dalila, drama biblique* (1877); *Etienne Maral* (1879); *Henry VIII* (1883); *Proserpine* (1887); *Ascanio* (1890); *Phryné* (1893); symphonic poems, piano and other instrumental compositions. See MUSIC.

SALEZA, ALBERT, opera singer, was born in the Basses-Pyrénées, France, in 1867. He studied at the Paris Conservatoire, winning the first prize for singing and the second for opera in 1888, and made his *début* as Mylio in *Le Roi d'Ys*. Engaged four years at the Paris Opera, he sang in the first performances of *Salammbô*, and *Otello*, he went to Nice for two seasons and made his London and American *Début* in 1898.

SALON. See PAINTING and SCULPTURE (paragraph Exhibitions).

SALT. Most of the salt produced in the United States during 1898 was brine salt, obtained by forcing water down into the salt beds, pumping up the brine and evaporating it. Rock salt was mined in New York, Kansas, Louisiana and Utah, and the other brine-producing States were Michigan, California, Illinois, Nevada, Massachusetts and Virginia. In California and Massachusetts salt was obtained by the evaporation of sea water.

The production was:

1896, 13,850,726 barrels, valued at.....	\$4,040,839
1897, 15,973,202 barrels, valued at.....	4,920,020

SALTS ON BLOOD CORPUSCLES. S. G. Hedin has shown that when ammonium sulphate, phosphate, tartrate and succinate are added to blood in small quantities, one grain to the gallon, they divide themselves equally between corpuscles and plasma, while larger quantities enter partly into the corpuscles, but remain principally in the plasma. The fraction that remains in the plasma increases with the amount of salt added up to five grains, and in those concentrations, where there is excess of salt in the plasma, the volume of the corpuscles diminishes. Ammonium chloride, bromide, nitrate, thio-cyanate, oxalate, ferro-cyanide, ferro-cyanide and lactate distribute themselves equally in plasma and corpuscles at all concentrations.

SALVADOR. The smallest, but most populous republic of Central America, comprises fourteen departments, whose aggregate area is 7,225 square miles; the population is estimated at 803,534. Of these only about 20,000 are of pure European descent, the great mass of the inhabitants being Indians and mixed races. The capital is San Salvador (pop. 25,000). Education is free and compulsory. Besides a national university with about 180 students, there are 18 schools for secondary education and higher education with about 1,200 students. There have been reported 585 primary schools with about 29,500 pupils. The government has at the capital a library and museum. Thirteen newspapers are published in the country.

Government.—Salvador became a separate and independent republic in 1853. By the constitution, adopted in 1864 and modified in 1880, 1883 and 1886, the chief executive authority is vested in a President, elected for four years, and assisted by four ministers who control the following departments: Interior and Government; Exterior, Justice, Instruction and Worship; War and Marine; Finance, Fomento and Beneficence. The President (1895-99) was General Don Rafael Antonio Gutierrez. The legislative power devolves upon a Congress of 70 deputies, elected for one year by popular vote. Of the deputies 42 are proprietors. Besides local justices and inferior courts, there is the Supreme Court of Justice. The government possesses one custom house cruiser and maintains an army of 4,000 men; the national guard numbers about 18,000.

Finance.—Revenues and expenditures in pesos have been:

	1892.	1893.	1894.
Revenue	6,895,703	7,133,000	8,818,000
Expenditure	6,784,529	7,153,000	8,569,000
			1896.
Revenue (estimated)			10,174,000
Expenditure (estimated)			9,745,000

The revenue is mainly derived from duties on imports and from the brandy tax; and the chief items of expenditure are the Departments of Finance, of War, of the Interior, and of Public Works. In 1896 the external national debt was \$1,236,980 and the internal debt about \$3,488,000 (each in United States currency). In August.

1897, Salvador adopted the gold standard. On October 1, 1898, the Director of the United States Mint estimated the value of the peso at \$0.436 United States currency.

Industries and Commerce.—Salvador is essentially an agricultural country, but there are also numerous mines producing gold, silver, quicksilver, copper, iron, and other minerals. The more important agricultural products are coffee, indigo, tobacco, and sugar; the export of these products in 1896 was: coffee, 7,500,000 pesos; indigo, 2,000,000 pesos; tobacco, 100,000 pesos. Among the principal imports are textiles and iron goods. The exports and dutiable imports in pesos have been:

	1894.	1895.	1896.
Exports	2,171,000	2,890,739	13,000,000
Imports	6,611,000	13,847,625	10,000,000

On October 1, 1898, a new tariff schedule went into effect pursuant to a decree of President Gutierrez; on an average the new rates are 22 per cent. less than the preceding ones. In 1896 there entered and cleared 338 vessels.

Communications.—The country has more than 2,000 miles of good roads. San Tecla, Ateos, and Santa Anna are connected by rail with the port Acajutla, the total length of the line being 72 miles. There is railway communication between Armenia and Ceiba, and Santa Tecla and San Salvador. Other roads are under construction, including the one from the port Unión to San Salvador, which is 124 miles in length and passes through several important towns. There are telephone lines, and in 1896 the length of telegraph wire was 1,724 miles. The telegraph offices number about 125 and the post-offices about 75. See CENTRAL AMERICA.

SALVATION ARMY is a body organized in 1865 by Rev. William Booth to evangelize the masses. Its international headquarters are 101 Queen Victoria street, London, E. C., and the headquarters for the United States are 120 West Fourteenth street, New York. General Booth is general and commander-in-chief of the army, which has 6,229 corps or societies scattered throughout the world. The annual rental roll is \$1,000,000. The Salvation Army of the United States reports for 1898, 735 corps or stations, 2,800 officers, 20,000 active workers, and about 375,000 members; 50,000 persons were converted, 39 relief institutions were added (making 120 in all), with increase of 150 officers (making a total of 400). This body can now accommodate 6,000 persons nightly. During the year there were organized three Farm Colonies, in California, Colorado, and Ohio, designed to relieve the density of the urban population. Work was done in the United States Army and Navy during the Spanish-American War. Salvation Army tents were erected at Chattanooga, Tampa, and Camp Alger. The Salvation Army has three periodicals, the *War Cry*, *Harbor Lights*, and *Social News*. It maintains 100 rescue homes for unfortunate women. In England there are 13,894 officers, 33,623 local officers, and 6,318 corps and outposts. The work is conducted in as many as 28 languages. See VOLUNTEERS OF AMERICA.

SLAVIN, OSBERT, M. A., F. R. S., distinguished ornithologist and entomologist, was born in 1835, and died January 1, 1898. He was editor and joint-author with F. Du Cane Godman of *Biologia Centrali Americana*, 1879. From 1874 to 1883 he was Strickland Curator in the University of Cambridge.

SAMOAN ISLANDS, or **NAVIGATOR'S ISLANDS**, lie in the Pacific ocean about 2,000 miles south and 300 miles west of the Hawaiian Islands, and have an area about 1,700 sq. m., with a population, according to the latest estimates available in 1898, of 26,000, including besides the natives, who are of Polynesian race, some 200 British subjects, 125 Germans, 25 Americans, 25 French, and 25 of other nationalities. The largest and most populous of the islands are Upolu, with a population of 16,600; Savaii, with 12,500, and Tutuila, with 3,700. The chief importance of the islands lies in the fact that they are but a short distance south of the steamship route, which would connect the Philippines with the proposed Panama or Nicaragua Canal, and that they afford a convenient stopping-place for vessels, plying between San Francisco and Australia. The United States, Germany and Great Britain have coaling stations on the islands. The coaling station of the United States is Pago Pago, in the island of Tutuila, which was acquired in 1872, and occupied by the United States in 1898. Most of the islands are of volcanic origin and have a very fertile soil. The chief products are cocoanuts, copra, cotton, sugar and coffee.

Commerce and Communications.—The chief articles of exports are cocoanuts and copra, the latter commodity being obtained by drying the kernel of the cocoanut. The official statistics for 1896, which were the latest that could be obtained in 1898, show that the larger part of this commodity was exported to Germany, but a considerable amount was also sent to the United States. It was recently reported by the United States Consul-General that the wars and rumors of war in the islands had seriously impaired the copra trade. It seems that a frequent accompaniment of warfare has been the destruction by one party of the cocoanut trees belonging to the other, such

destruction being easily accomplished by merely cutting off the crown of the tree, after which it can no longer bear fruit. It was also reported that the German trade in recent years had gradually declined, the American and British trade having advanced in equal proportions. In 1896 the imports to the Samoan Islands amounted to \$304,159, and the exports from the Samoan Islands to \$263,047. The declared value of exports from the consular district of Apia to the United States during the year ending June 30, 1896, was \$12,975.20, and the imports from the United States during the year 1896 was \$47,552. The currency consists of British coins, but values are reckoned in terms of United States currency. Communication between the islands is afforded by small sailing vessels and one steamer; with other parts of the world by the vessels engaged in the mail service between San Francisco and Sidney, New South Wales, and the vessels of the Union Steamship Company, of New Zealand.

Government and History.—The following statement in regard to the government and present political situation in the islands is taken from the United States official report:

"The government of the Samoan Islands had been from time immemorial under the two royal houses of Malietoa and Tupea, except on the island of Tutuila, which was governed by native chiefs. In 1873, at the suggestion of foreign residents, a house of nobles and a house of representatives were established, with Malietoa, Laupepa, and the chief of the royal house of Tupea as joint kings. Subsequently Malietoa became sole King. In 1887 he was deposed by the German government upon the claim of unjust treatment of German subjects, who formed the bulk of the foreign population on the island, and was deported first to German New Guinea and then to the Cameroons, in Africa, and finally in 1888 to Hamburg. Tamasese, a native chief, being meantime proclaimed by the Germans as King, though against the protest of the British and American consuls at Samoa. Mataafa, a near relative of Malietoa, made war upon Tamasese and succeeded to the kingship.

"In 1889 a conference between the representatives of the American, British, and German governments was held at Berlin, at which a treaty was signed by the three powers guaranteeing the neutrality of the islands, in which the citizens of the three signatory powers would have equal rights of residence, trade, and personal protection. They agreed to recognize the independence of the Samoan government and the free rights of the natives to elect their chief or king and choose a form of government according to their own laws and customs. A Supreme Court was established, consisting of one judge, who is styled the Chief Justice of Samoa, and who is at present W. L. Chambers, an American, formerly a resident of the State of Alabama. To this court are referred: First, all civil suits concerning real property situated in Samoa; second, all civil suits between natives and foreigners or between foreigners of different nationalities; third, all crimes committed by natives against foreigners or committed by such foreigners as are not subject to any consular jurisdiction.

"The future alienation of lands was prohibited, with certain specified exemptions. The capital was located at Apia, the chief town of the group of islands, and a local administration provided for the municipal district of Apia. A commission was appointed to investigate titles to lands alleged to have been purchased from the natives, and this in 1894 completed its labors, confirming about 75,000 acres of lands to Germans, 36,000 to British, and 21,000 to Americans, though much of this land has since changed hands. Malietoa, who had been deported, was restored as King in November, 1889, and continued as such until his death, which occurred August 22, 1898, when the consuls of the three powers, with the Chief Justice as President, took charge of the administration pending the election of a successor. It is out of the election and recognition of this successor to King Malietoa, deceased, that the recent disagreements between the representatives of the three governments maintaining the joint protectorate over the islands have occurred."

Malietoa was called "the saddest man in the Pacific," for he was not only harassed, but was deprived of royal dignity by the almost constant intervention, not to say coercion, of the foreign, and in particular the German officials. He was a man of interesting personality, for though descended from savage ancestors, he had a kind and patient disposition. So thoroughly patriotic was he that even in his exile he constantly showed a deep unselfish interest in the welfare of Samoa. He was a kindly but dispirited man, so weak in character that he could neither firmly and permanently attach himself to any one of the three great nations, nor remain neutral without incurring the dislike of the representatives of all three. He received the mean salary of £30 a month, and it is said that had not the American government presented him with the wrecks of the *Trenton* and *Vadalla* he would never have had a decent residence. He was a friend of the late Robert Louis Stevenson, and his grave is near that of the distinguished author.

SAMPSON, WILLIAM T., Rear-Admiral, U. S. N., who commanded the American fleet before Santiago, was born in New York, and having entered the navy September 24, 1857, attended the Academy at Annapolis until 1860. He was made master 1861,

lieutenant, July, 1862, serving during the Civil War on the practice ship *John Adams* and the monitor *Patapsco*. He was on the latter vessel when it was destroyed by a torpedo at Charleston, January 15, 1865. During the next two years he served on the flagship *Colorado* (European squadron), advancing to the rank of lieutenant-commander. He was on duty for a time at the Naval Academy, and after further service with the European squadron, was promoted to the rank of commander, August 9, 1874, and in 1889 became captain. From 1886 to 1890 he was superintendent of the Naval Academy, and during the two years following commanded the protected cruiser *San Francisco*. He was chief of the bureau of ordinance from January, 1892, until 1897, when, on June 15, he took command of the battleship *Iowa*. Just before the outbreak of the Spanish-American War he succeeded Rear-Admiral Montgomery Sicard in command of the North Atlantic squadron (flagship armored cruiser *New York*). He had in his control more than seventy vessels, "the largest and most powerful fleet that has ever gathered under the United States flag." He was appointed by President McKinley, acting rear-admiral; became commodore on July 3, 1898, by the retirement of Rear-Admiral William A. Kirkland; on August 10, for his excellent work in the Santiago blockade (see SPANISH-AMERICAN WAR), he was appointed a rear-admiral, being advanced eight numbers and ranking next after Rear-Admiral John A. Howell. The latter was promoted to this rank on August 10, by the retirement of Rear-Admiral Charles S. Norton. On August 16, 1898, Rear-Admiral Sampson was appointed by the President, one of the commissioners to arrange for the evacuation of Cuba by the Spaniards.

SAN DOMINGO, or the **DOMINICAN REPUBLIC**, embracing the eastern part of the island of Haiti, has an estimated area of 18,045 square miles and a population, officially estimated in 1888, of 610,000. The inhabitants are chiefly a mixed race of Spanish and Indian blood, but negroes, mulattoes, and whites are numerous. Spanish is the prevailing language. The capital is Santo Domingo (population 14-150); Puerto Plata is the principal port and has 4,500 inhabitants. Primary education is free and compulsory; the primary schools number about 300 with 10,000 pupils. There are also schools for higher and public education, and about forty newspapers are published.

Government, etc.—According to the constitution the chief executive authority is vested in a president chosen for four years by an electoral college; he is assisted by a ministry, appointed by himself, representing the departments of the Interior and Police, Justice and Public Instruction, Public Works and Foreign Affairs, Finance and Commerce, War and Marine. The president for the term beginning 1897 is General Don Ulises Heureaux. The legislative power devolves upon a Congress of 22 deputies elected by popular vote. For the provinces and sub-districts there are governors and prefects respectively, the former appointed by the president and the latter by the governors. There are local justices, eleven courts of first instance, and the Supreme Court of Justice, the members of which hold office during the presidential term. Besides having a reserve corps, the government maintains a regiment in each provincial capital; the navy consists of three small steamers.

Finance.—The revenue for 1895 was \$1,382,500 and the expenditure \$1,351,250; the revenue for 1896 was \$1,545,450. Duties on imports and exports are the chief source of revenue. At the beginning of 1898 the total public debt amounted to £2,861,000 (\$13,933,070). The silver standard based on the Mexican dollar has been the monetary standard of San Domingo, but in 1894 the government adopted the United States gold dollar as its standard of value. There has been no coinage, however, pursuant to this law.

Industry, Commerce, etc.—The principal occupation of the people is agriculture; about 15,500 square miles are fit for cultivation. Mining is not carried on, although gold, copper, iron, coal, salt, and other minerals are known to exist. The cultivation of coffee, bananas, sugar cane, and cocoa is increasing, but a falling off has been noted in tobacco culture. The chief exports, named in the order of their value, are tobacco, coffee, cocoa, sugar, mahogany, logwood, hides, goatskins, honey. Among the principal imports are cottons, iron goods, bread stuffs, and earthenware. The foreign commerce is small; imports, valued in gold pesos, amounted in 1896 to 1,703,595, and the exports to 2,198,817. Internal communication is difficult. The total length of railway open is 116 miles; one line of 62 miles connects Sanchez with La Vega and is projected to Santiago; another projected line will connect Barahana with Cerro de Sal. There are 430 miles of telegraph; 51 post-offices.

SANDSTONE. See BUILDING STONES.

SANDWICH ISLANDS. See HAWAIIAN ISLANDS.

SANITARY ASSOCIATION, AMERICAN, organized 1893, with the objects of aiding in the maintenance of public health, discouraging the manufacture and sale of impure and injurious foods, and medicines, encouraging the manufacture and sale of wholesome and honest food, certifying as to the character of foods, medicines

and sanitary appliances, and distributing general public information about sanitary matters. Secretary W. Thornton Parker, M. D., Groveland, Mass.

SAN FRANCISCO. In June, 1898, a new charter was adopted in San Francisco by popular vote. Its main features are the increase of the board of supervisors, that is, the city legislature, from twelve to eighteen members; the introduction of the referendum and the initiative for city ordinances and charter amendments upon petition of fifteen per cent. of the voters; the increase of the mayor's power, including appointments without need of subsequent confirmation, and the power of removal for cause; the reduction of the number of officers elected directly by the popular vote; the establishment of civil service examinations; and provisions dealing with municipal monopolies. It is required that all grants of franchises shall be approved by popular vote, and it is asserted that it is the purpose of the city gradually to acquire what are termed "popular utilities."

SANITARY LEGISLATION. Ohio has recently joined Massachusetts in requiring that all plans for new water supply and sewerage systems should be submitted to its State board of health for approval. In New York this is required for sewerage and sewage purification systems. Connecticut, New Jersey, Pennsylvania and Illinois, and perhaps other States, are trying to secure similar legislation. The purpose is the better protection of the purity of inland waters. Extensions of powers, in the interest of public health, are constantly being given to State and local boards of health throughout the country, but some States are still woefully deficient in these matters. Local, or municipal, legislation in the interest of public health, relates chiefly to the restriction of specific diseases through quarantine and through the inspection of plumbing and of milk and food supplies. A number of cities have recently passed ordinances prohibiting expectoration in street cars and other public places. This is designed to check the spread of tuberculosis, the germs of which pass from the dried sputa of consumptives into the air thus sowing the seed for a new crop of the disease.

SANITATION. See GARBAGE and SEWAGE PURIFICATION.

SARAWAK. See BORNEO.

SARCOMA. See SERUM THERAPY.

SARGENT, JOHN SINGER, artist, born in Florence in 1856. He is the son of a Boston physician, studied under Carolus-Duran, and took a second class medal at the Paris Salon in 1881, and a medal of honor at the Paris Exposition in 1889. He received the Legion of Honor in 1881. Sargent is considered one of the greatest living portrait painters. His portrait of Calvin S. Brice attracted attention in 1898.

SCANLAN, WILLIAM J., the well-known Irish actor, died in the Bloomingdale Asylum, White Plains, New York, February 18, 1898. He was born in Springfield, Massachusetts, February 14, 1856. Mr. Scanlan showed his peculiar ability in romantic Irish drama. He wrote many popular songs, the best known of which, perhaps, was *Peek-a-Boo*.

SCARLET FEVER. See PUBLIC HEALTH.

SCHALK, FRANZ, musical conductor, was born in Vienna, in 1863. He played in the orchestra at the Vienna opera, studied composition under Anton Bruckner, and became conductor at the Stadt Theatre, Graz. Mr. Schalk succeeded Anton Seidl as conductor of the German Opera and Philharmonic concerts in Prague, and also succeeded Seidl as conductor of the German Opera in Maurice Grau's Company, in New York. He made his first American appearance in Chicago in 1898.

SCHLEURER-KESTNER, M., a French scientist, prominent in 1898 in connection with the Dreyfus affair (see FRANCE). He apparently came to the conclusion that Alfred Dreyfus was innocent simply from a result of impartial study of the question. He gave a whole year to the subject, and in October, 1897, publicly declared that he had proofs that Dreyfus was not guilty. He offered to submit these proofs to Gen. Billot. He testified at the first Zola trial that having heard in the autumn of 1896 that Col. Picquart had discovered that the handwriting of the *bordereau* was not that of Dreyfus, he began the study of the matter himself, and found proof, which in his opinion was conclusive, of the innocence of the accused officer.

SCHLEY, WINFIELD SCOTT, Rear-Admiral, U. S. N., was born in Maryland in 1839. He entered the navy as a midshipman in 1856, attended the Naval Academy at Annapolis until 1861, and was appointed master, being assigned to the *Potomac*. He saw much active service during the Civil War with the West Gulf blockading squadron, and in 1863 took part in the capture of Port Hudson. He subsequently served in the Pacific squadron; was made lieutenant-commander in 1866, commander in 1874, captain in March, 1888, and commodore in February, 1898. In 1884 he commanded the successful expedition sent to rescue Lieut. Greeley, the Arctic explorer; and he was in command of the protected cruiser *Baltimore* when one of her crew was killed and several injured by a Chilean mob in Valpariso. He was chief of the

bureau of equipment and recruiting, 1885-89, was appointed light-house inspector, 1892, and in 1895 became commander of the armored cruiser *New York*. In the early part of 1898 he took command of the "flying squadron" (flagship, armored cruiser *Brooklyn*) at Hampton Roads, which later took part in the blockade of Cuba and the Santiago fight (July 3). On August 10, for conspicuous service in the war, he was advanced six numbers, becoming rear-admiral and ranking next below Rear-Admiral William T. Sampson. On August 16, he was appointed by President McKinley a member of the commission to arrange for the evacuation of Porto Rico by the Spaniards. See SPANISH-AMERICAN WAR.

SCHOOL AT ATHENS, AMERICAN. See ARCHÆOLOGY (paragraph Greece).

SCHUMANN-HEINK, ERNESTINE, opera-singer, born about 1860: made her *début* as Azucena in *Il Trovatore* in Dresden in 1878 and went to Hamburg to sing at the Stadt Theatre for eight years. Her success in Bayreuth as Erda, Waltrante, and the first Norn in the *Ring* in 1896 gave her a universal reputation. She also sang these characters in London in 1898, and made her American *début* in that year. Frau Schumann-Heink has a rich voice of remarkable compass.

SCHWARZKOPPEN, COLONEL VON, the military attaché of the German embassy at Paris from 1892 to 1897, was the officer with whom Dreyfus was said to be in communication. Between him and his friend Col. Panizzardi, letters passed in regard to information imparted by some mysterious agent in the French military service. Col. Schwarzkoppen is said to have virtually acknowledged that Esterhazy was the secret bearer of this information, and the story is told that he expressed great relief when after hearing that a French informer was arrested it turned out to be Dreyfus instead of Esterhazy. See FRANCE (paragraphs on History).

SCOTCH-IRISH SOCIETY, organized in Columbia, Tenn., in 1889, while the first Scotch-Irish Congress was being held. The membership includes both sexes and is composed of people of Scotch-Irish descent in the United States and Canada, its purpose being "the preservation of Scotch-Irish history and associations, the increase and diffusion of knowledge regarding the Scotch-Irish people, the keeping alive of the characteristic qualities and sentiments of the race, the promotion of intelligent patriotism, and the development of social intercourse and fraternal feeling." There are State societies, each having vice-presidents. President, Robert Bonner, New York, Vice-President-General and Secretary Rev. T. S. MacIntosh, D. D., 220 Witherspoon Building, Philadelphia.

SCOTLAND is the northern part of the island of Great Britain, with an area of 29,785 sq. m., and a population of 4,025,647. It forms an integral part of the United Kingdom, and is represented in the British House of Commons by 72 members, who were divided according to political parties in November, 1898, as follows: 13 Liberal Unionists, 40 Liberals and 19 Conservatives, and in the House of Lords by 16 representatives of the Scottish Peers. There is a local government board for Scotland, of which the Secretary for Scotland is *ex-officio* President. The annual report of this board, issued in April, 1898, showed that the number of the poor in receipt of relief in May, 1897, was 99,503, and that the total expenditure for that purpose during the year ending on May 15, 1897, was 1,508,214. The commercial and other statistics of Scotland are merged in those of Great Britain (q. v.).

SCOTLAND, CHURCH OF, is Presbyterian in constitution, consisting of a General Assembly with representatives from the presbyteries, universities, and royal burghs, and presided over by a moderator. A Lord High Commissioner represents the sovereign. There are 16 synods, 84 presbyteries, and about 1,800 ministers and licentiates. In 1897 there were 641,803 communicants. In that year £485,695 were raised for missionary work. In 1898, 405 new and 42 Parliamentary parishes, 203 unendowed churches, and 184 mission stations were added.

SCOTLAND, CHURCH OF (the Episcopal Church), has 331 churches and mission stations, 151 parsonages, 337 clergy, 7 bishops, and 44,503 communicants. The Sees are: Aberdeen, Argyll, Brechin, Edinburgh, Glasgow, Moray, and St. Andrew.

SCOTTISH CLANS, a fraternal society, founded in 1878, has 2 grand clans, 102 subordinate clans, and 4,689 members. Since its organization it has disbursed \$530,000, and \$39,500 during its last fiscal year. Royal Chief, W. H. Steen, Braidwood, Ill.; Royal Secretary, Peter Kerr, South Boston, Mass.

SCULPTURE IN 1898. *Acquisitions.*—The most interesting event of the year was the safe arrival in the Louvre of the "Bust of Elche," some account of which is given in the paragraph on Spain in the article Archæology (q. v). It was found in September 1897, by peasants at Elche, southwest of Alicante in Valencia, Spain, and it was quickly secured for the Louvre by M. Noel Bardac before the knowledge of the discovery reached Madrid, where there are similar sculptures known as "Cerro de los Santos" in the Museum, also found near Elche. It is Græco-Phœnician sculpture,

made before the invasion of the Romans. The mysterious majesty of the face justifies a supposition that it is the portrait of a queen. The lips are still red, and the fold across the forehead and the robe are also red. The necklaces, the head-dress, and the wheel-shaped ornaments on each side of the head are barbaric and highly decorative. This bust was placed in the old apartments of Henri IV. The Louvre also acquired a fine collection of statuettes in metals and semi-precious stones, including Egyptian figures in gold of "Osiris," "Horus," and "Isis," and a new hall was opened to extend the Museum of Mediæval, Renaissance and Modern Sculpture. The additions included thirty statues, busts and bas-reliefs, and a number of models, fragments and statuettes of various characters and dates. Among the Mediæval examples are a large statue of "Christ," painted and gilt, presented by M. Courajod; a statue of stone, "Ste. Geneviève," from the abbey church of Paris; a wooden statue of a king, 13th century; the head of a bishop of the 15th century from Châlons-sur-Marne; three large statues,—"Ste. Anne" with the young Virgin; "St. Peter," and "Ste. Suzanne" from the Château de Chantelle, made for Anne de Beaujeu; a model in terra-cotta by John of Bologna; and a monument by S. de Franqueville. Among the modern sculptures the important additions are: Houdon's busts of "Louise Brongniart" and "Lavoisier," and several busts by Carpeaux, Barye, Houdon, Pajou and Clodion.

Exhibitions.—The third exhibition of the National Sculpture Society of America was held in the Fine Arts Building, New York. An Italian garden was arranged in which were placed works by the President, J. Q. A. Ward, French, J. Massey Rhind, Ralph Goddard, Carl Meyer, and H. K. Bush-Brown; John Donoghue's statuettes after the antique; Bessie Potter's modern portraits; J. Scott Hartley's busts of "Edwin Booth" and "John Drew;" and Herbert Adams's colored statuary. Other notable contributions were Nichau's "Hahnemann's Monument;" Elwell's "Egypt Awakened;" French's heroic statue of "Rufus Choate;" a "Magdalen," by Clement J. Barnhorn, of Cincinnati; "Confederate Cavalryman," for the Georgia State monument, Chickamauga, by Frederick Moynahan; Olin Warner's doors for Congressional Library, completed by Herbert Adams; "Symbol of Life," by Grafly, of Philadelphia; and "Ball Player," by Wilson, of Princeton. A prize was given to Philip Martiny for Soldiers' and Sailors' Monument. A collection of ivories belonging to James F. Drummond was also exhibited and designs for sun-dials formed a new feature. Charles Lopez won a \$500 prize and W. C. Maynard the second prize of \$250.

The statue of "Balzac" by A. Rodin, exhibited in the Paris Salon, created a storm of violent criticism. It is very rough and represents Balzac in his dressing gown. The sculptor insists that he has expressed "*l'esprit de Balzac*." Bodin was commissioned by the *Société des Gens de Lettres*, but his work was declined with indignation and was supplanted by Falguière's more finished and sane production, showing Balzac in the act of writing. At the Salon, Falguière exhibited a statue of "Cardinal Lavigerie;" Mercié "Psyche on the Rock" and "In the Seraglio," a bust in tinted wax; Rodin, a marble group, "The Kiss"; Damp, a bas-relief, "Time Bearing Away Love," and "The Sphinx"; Injalbert, "A Drunken Satyr and Bacchante"; René de Saint Marceaux, a group, "What Fates Attend Us?"; Antonin Cartes, "Nymphs of the Oise"; A. Lefevre, "Sylphs;" and Bartholdi, a spirited and fanciful allegory, "The Saône;" Gerome, "Tamerlane;" Frederick MacMonnies, "Quadriga," on a colossal scale for Prospect Park, Brooklyn; and Georges Gardet, "Tigers and Lions and Danish Dogs," for which he was given the medal of honor. First-class medals were given to Levasseur, Lefebvre, Loiseau-Rousseau, Medalist H. Dubois. Second-class medals to MM. Peter, Bernard, Plé, Laporte-Blairsy, Maillard and Roussel. Third-class medals to MM. Mühlenbeck, Vermare, Darbefeulle, Stigell, Castex, Girardin, Ducuing, Carli, Derré, Breton, Guillaume, Roux, Medalist, Yencesse, Dropsy. The two best women sculptors were Mme. Louise Carpeaux and Mlle. Camille Claudel.

The sculpture shown at the Royal Academy, London, was of a high order, but there was nothing heroic. Much fine sculpture was shown at the Loan Exhibition of Mediæval and Renaissance Art in Berlin; the International Society of Sculptors, Painters and Gravers exhibited 500 works at Knightsbridge, London, the best examples being Kaufmann's bronze statuette of Phryne, John's "Boy at Play," Taubmann's "Dish in Tin," and Furze's "Lioness and Cubs." The sculptors exhibiting at the sixty-seventh annual exhibition of the Pennsylvania Academy of Fine Arts, included Paul Bartlett, H. K. Bush-Brown, F. E. Elwell, Ralph Goddard, Frederick MacMonnies, Charles Grafly, Augustus St. Gaudens, Caroline C. Peddie, and J. Scott Hartley; the Society of American Artists exhibited statuettes and two marble reliefs by Herbert Adams; a bust of "Ophelia," by Ernest W. Keyser (shown at the Paris Salon of 1897), was exhibited at Knoedler's; bronze and other works in metal by Angelo del Neri were exhibited at the Union League Club (the sculptor being present); and a remarkable work, "The Boulder," by R. M. Bock, representing a crouching old man rooted in the earth, was shown at the Chicago Architectural Club's exhibition in Chicago.

Agathon Leonard exhibited at the Société of the Rue Volney, Paris, a head of Christ, called "Le Drame du Vendredi Saint," which attracted attention. A colossal equestrian statue, "Energy," on which G. F. Watts had been working for years, was accepted in London and destined to stand at the end of the Serpentine, Hyde Park.

A collection of German portrait medals of the Renaissance, belonging to T. W. Greene, of Winchester, England, was exhibited and sold in Frankfort. They included "A Dürer," "Philip II of Spain," "Maximilian I," "Charles V," "Calvin," "Erasmus," "Luther," "Philip le Bel," and "Sigismund I. of Poland."

Three new statues were placed in the niches of the National Portrait Gallery, Edinburgh,—“James I of Scotland,” and “Napier of Merchiston,” by D. W. Stevenson; and “Alexander III,” by W. G. Stevenson. Bernini’s bust of “Cromwell” was placed in front of St. Stephen’s Palace, London; “Boadicea” group, by Thorneycroft on Westminster Bridge, London; Falguière’s statue of “Dr. Charcot” in the Cour de l’Hospice de la Salpêtrière, Paris; a statue of “Jeanne d’Arc” by Lanson, in Jargeau near Orléans; a statue of “Millet,” by Martel Jacques in his native town, Gréville; George Grey Barnard’s colossal “Pan” was cast in bronze (the gift of Alfred Corning Clark), for Central Park, New York; a memorial to “Richard M. Hunt,” by Daniel C. French was unveiled in Central Park; bronze statues by J. Massey Rhind, of “Hudson,” “Stuyvesant,” “Wolfe,” and “Clinton” were placed in lower Broadway; and the “Heine Memorial Fountain” was accepted by the Municipal Art Commission to be erected on 161st street and Mott avenue.

SEALING. The act of December 28, 1897, forbidding the citizens of the United States to take fur seals or to fit out vessels in the United States for seal-fishing in the Pacific Ocean north of the 35th degree of north latitude, put an end to the taking of seals by vessels belonging to the United States within that area, but the British sealing fleet continued to capture seals on the northwest coast and in the Behring Sea. According to the report of the Secretary of the Treasury covering the fiscal year 1898, the total catch in the spring of 1898 was 10,581 as compared with 6,100 skins taken by the same fleet during the season of 1897. The department authorities attributed this increase in the catch not to an increase in the numbers of the herd, but to the fact that the American fleet did not take part. It was reported that a smaller number of seals frequented the Pribyloff Islands in the spring of 1898 than in the previous season. It was believed that the complete cessation of pelagic sealing was the only possible means of preserving the Pribyloff herd. See the article **BEHRING SEA DISPUTE**.

SEAL FISHERIES. See **DISTRIBUTION OF ANIMALS** (second paragraph).

SECONDARY BATTERY. See **ACCUMULATORS**.

SEGUIN, EDWARD CONSTANT, M. D., specialist in nervous diseases, died in New York City, February 19, 1898. He was born in Paris, France, in 1843. As a surgeon he rendered valuable service during the Civil War. He lectured, 1871-75, on insanity and on the diseases of the spinal cord, at the College of Physicians and Surgeons, New York.

SEIDL, ANTON, one of the greatest orchestra leaders of his time, died in New York, March 28, 1898. He was born at Budapest in 1850. His musical opportunities were almost ideal, as in 1872 he became secretary to Wagner and subsequently held important positions as accompanist and as conductor in the musical centres of Germany, Italy, and England. The approval that he won with his first appearance in America remained with him, or rather increased, till the time of his death. He it was who first presented in this country *Die Meistersinger*, *Tristan und Isolde*, *Götterdämmerung*, and *Rheingold*. Up to this time few had appreciated the poetic beauty and real greatness of Wagner; but Seidl himself a man of deep poetic feeling, interpreted his master with such clearness, beauty, and force that the New York public which had not hitherto appreciated Wagner became thoroughly enthusiastic. Seidl was not devoted to Wagner alone, but was a master in interpreting Beethoven, Mozart, Tschaikowsky, Dvorak, and other great composers. Upon his death it was felt in New York that his place could not be filled, so much had he done in making men feel the real significance and beauty of great music. Before coming to America in 1885, Herr Seidl married in Bremen Fraülein Krauss, a prominent soprano singer.

SELENIUM has been recently used by glass-workers for the production of colored glass. By using this metal alone a delicate rose tint can be obtained which can be varied in depth according to the amount of selenium that may be in use. A mixture of selenium and cadmium sulphides produces a fine orange, the intensity of the yellow being regulated by the cadmium. In the ordinary methods of making red glass it is necessary to re-heat the glass, this is avoided by the use of selenium.

SELWYN, Rt. Rev. JOHN RICHARDSON, D. D., master of Selwyn College, Cambridge, died February 12, 1898. He was born in New Zealand, May 20, 1844, being the second son of the famous George Augustus Selwyn, Bishop of New Zealand and

Lichfield; he was educated at Eton and at Trinity College, Cambridge, and was ordained in 1869, becoming curate of Alrewas. In 1871-72 he was vicar of St. George's, Wolverhampton. In 1873 he entered on the Melanesian mission and about four years later succeeded Bishop Patterson, the first bishop of Melanesia, who was murdered by the natives. Dr. Selwyn occupied this position until 1891 and two years later became master of Selwyn College.

SEMBRICH, MARCELLA, opera-singer, born at Lemberg, Austria, February 18, 1858. She studied the piano, violin, and singing, the latter at the Milan Conservatory. Her first appearance took place in *I Puritani* at Athens in 1877. Mme. Sembrich has sung in all the large cities of Europe with the greatest success. She is regarded by many as the greatest singer living, and is unexcelled as an interpreter of Mozart. In 1883-84 she sang in New York and re-appeared in concerts in America in 1897-98. In 1898-99 she was a member of the Grau Company.

SENEGAL, one of the most valuable of the French possessions on the West African coast and the oldest of her African possessions, extends along the coast from a point to the north of Cape Verde to British Gambia on the south, and has an area (including Rivières du Sud) of over 14,700 square miles and a population of 174,000. But if the various protected states be included the total area and population would be about 115,800 square miles and 2,000,000 inhabitants. The chief town is St. Louis with a population of 20,000, and another important place is Dakar with a population of about 2,000. The chief products and exports are gum, ground nuts, India rubber, palm nuts, palm oil, hides and horns, mats and gold. The trade is said to be larger than that of any other French possession in Africa. Considerable progress has been made in the building of railway and telegraph lines. There is a railway from St. Louis to Dakar, and another one has been begun from Kayes at the head of navigation on the Senegal in the direction of the Upper Niger. A later project for connecting the Niger with the coast is the proposed road from Konakry on the coast to the Niger. The executive authority of Senegal is intrusted to a governor-general, aided by a colonial council, and there is a small army chiefly composed of natives. Norman traders began to deal with Senegal in the 17th century, but no attempt was made to develop the country by permanent settlements in the interior. It was not until after 1854 that the work of extending French jurisdiction over the inland country was seriously undertaken. One of the most active prosecutors of this work was General Faidherbe. The region of Senegal proper was subdued without much difficulty, the inhabitants being for the most part peaceably inclined and showing some capacity for the arts of civilization. But to carry French influence over the Upper Senegal and the region of French Soudan generally was a matter of great difficulty. The reputed wealth of Timbuctoo, which at one time controlled the upper and middle portions of the Niger basin, offered a powerful attraction to French enterprise. The hostile chiefs were pushed back or subdued and by 1898 the only powerful native ruler that still held out in this region was Samory, who had been repeatedly defeated but was still able to exercise a tyranny over the natives on the borders of Sierra Leone, Liberia, and the Ivory Coast. He was captured by the French about Oct. 1, 1898.

SENFF ZOOLOGICAL EXPEDITION. See ZOÖLOGICAL STATIONS (paragraph Senff Expedition).

SENTER, DE WITT CLINTON, ex-Governor of Tennessee, died near Morristown in that State in June, 1898. He was born at Harriman, Roane county, Tennessee, in 1831; became prominent in the Whig party, was a member of the lower house of the State legislature before the war, and was a delegate to the famous Union convention held in Knoxville and Greenville in 1861. He was a candidate for presidential elector at large on the Grant and Colfax ticket in 1868, and the same year being sent to the State Senate was made its president; by the resignation of Gov. William G. Brownlow, the governorship devolved upon Mr. Senter, and he was elected for the next term by a large majority.

SEPTICÆMIA, PUERPERAL. See SERUM THERAPY.

SEPTIC TANK. See SEWAGE PURIFICATION.

SERUM THERAPY. Immunity to disease is a natural insensitiveness to infection or contagion which is possessed by certain individuals or families, or may be a racial characteristic. Acquired immunity to a disease may result from a previous attack of the disease, or from a change in the blood due to an addition to it derived from serum hypodermically introduced. Animals are inoculated with a given disease, and after their blood has undergone certain changes, its serum is used hypodermically in man to combat or prevent that disease. Certain principles called antitoxins are developed in the animal blood serum which neutralize the toxins developed by or contained in the bodies of the bacteria causing the different diseases. The use of blood derivatives containing antitoxins, in the treatment or prevention of disease, is called serum therapy. The discovery by Pasteur in 1857 of the bacterial origin of

fermentation led to the discovery of different antitoxins and the establishment of serum therapy in these latter days.

Diphtheria.—The best known antitoxin, popularly, from its wide and increasing use is that used in combatting diphtheria, and obtained from serum of animals inoculated with cultures of the Klebs-Loeffler bacillus. While there are a few men of ability and experience who deny its efficacy, a vast number who have thoroughly tested its usefulness contribute an overwhelming and convincing mass of evidence in its favor. The past year has added to this favorable report. See DIPHTHERIA.

Erysipelas.—For purposes of immunizing as well as for curative use in all stages of an attack, Marmorek's serum is indicated. It is claimed to be uniformly successful. Marmorek's serum media maintain the virulence of cultures of streptococcus pyogenes. His most useful serum is composed of human blood serum, two parts, bouillon, two parts. This is sterilized and used in a fluid form. Less useful is the serum composed of asses' or mules' blood serum, two parts, bouillon, one part.

Puerperal Septicæmia.—In a large proportion of the cases of puerperal septicæmia, or child-birth fever, the cause is infection with some form of the streptococcus bacillus. The disease is satisfactorily combatted by the use of Marmorek's antistreptococcic serum.

Tetanus.—The infectious character of this disease was discovered by Carle and Rattone in 1894, and its bacillus was isolated by Nicolaier in the same year. Kitasato about 1897 first obtained the germ in pure cultures, and since that date many experiments have been made with antitetanic serum. Formerly the mortality in cases of tetanus was extremely great; cases in the very young (*trismus nascentium*) were almost uniformly fatal. In the United States, the mortality under the use of antitetanic serum is less than 35 per cent., to quote from the reports of cases by Dennis, of New York, of the past two years.

Tuberculosis.—Moderate but encouraging results have been reached with tubercle serum during 1898. See TUBERCULOSIS.

Typhoid Fever.—Many attempts have been made to provide a reliable serum for use in typhoid fever, without marked success. During the past year Chantemesse, of Paris, has had very satisfactory results from a serum devised by himself, which causes rapid defervescence and general improvement. See TYPHOID FEVER.

Yellow Fever.—The prize of one hundred thousand dollars offered by the Republic of Brazil for the discovery of the cause of yellow fever has resulted in much earnest work, culminating in Sanarelli's discovery of the *bacillus icteroides* and his devising of an antitoxic serum. Its success has been encouraging. See YELLOW FEVER.

Snake Bite.—Each year shows proof of the curative effect of the "antitoxin of snake venom," if used within eighty or ninety minutes after the reception of the bite. Calmette has shown, in former years, that this antidote furnishes only a transitory immunity by means of cell stimulation, and is not a true antitoxin.

Pneumonia.—Serums have been used with gratifying success in pneumonia. During an epidemic of pneumonia in Naples, in January, 1898, Pane treated nine very grave cases of pneumonia with antipneumococcic serum, with a mortal result in but one case. Surprising results are reported by Weisbacker, of Munich, in seventeen cases of pneumonia treated in 1898 with hypodermic injections of blood serum obtained from convalescents from the same disease. When it was used early, consolidation was incomplete, and the patients recovered rapidly. In every case the symptoms all disappeared except the fever and the physical signs in the chest. But two cases died, and these from cardiac complications, in an aged man of 78 and an emphysematous individual respectively. Last year similar results were obtained by Huber and Blumenthal, of Berlin, who employed injections of a mixture of chloroform, chloride of sodium and blood serum from convalescents.

Sarcoma.—The mixture devised by Coley, of New York, some years ago, from cultures of baccillus prodigiosus, has been successful in a fair proportion of cases of sarcoma.

Streptococcal Infection.—Many diseases are made rapidly fatal through the virulence of streptococcus infection added to the original bacterial invasion. Scarlet fever, diphtheria and tuberculosis are almost always complicated by streptococcal infection. While erysipelas, phlegmon, septicæmia from infected wounds, and most cases of puerperal septicæmia are caused by the streptococcus bacillus. Their cure is very frequently effected by the use of Marmorek's serum. (See paragraph Erysipelas). Many other diseases have been subjected to treatment by the serum therapy, with varying success.

SERBIA, a kingdom in the Balkan Peninsula formerly a self-governing province of Turkey but independent since 1878. It has an area of 19,050 square miles, with a population on December 31, 1895, of 2,314,153. The capital is Belgrade with a population of 59,494. Agriculture is almost the exclusive occupation and the chief exports are agricultural produce, fruits, animals and animal produce, but the country is said to have considerable mineral resources. In 1896 the total railway mileage was 354.

As to the finances, the main sources of revenue are direct taxes and monopolies, but the railways, public domains, posts and telegraphs and the customs also yield a considerable income. The estimated revenue in 1897-98 was 63,659,720 dinars and the expenditure 63,355,607 dinars (the dinar being equivalent to a franc, that is in United States currency about 19.3 cents). The Servian debt on January 8, 1898, was 409,537,500 dinars, of which the greater portion bore interest at 4 per cent. The army comprises an active army, a reserve and a national militia. On a war footing the three branches together had an estimated strength in 1897 of 353,366 men. In government Serbia is a constitutional monarchy, the executive power being vested in a King, who is aided by a council of eight ministers. The legislative authority is vested in the King and the national assembly or Skupschtina. There is also a Senate or Council of State, a permanent body which considers and elaborates legislative projects. The constitution in which these principles were embodied, however, was abrogated in 1894 and the constitution of 1869 went into operation provisionally until a commission should draft a new constitution. According to this provisional constitution the government controls the appointment of one-third of the members of the Skupschtina and the choice of the remaining two-thirds is made by open voting. The effect of this is to increase the arbitrary power of the crown. The reigning sovereign is Alexander I, son of King Milan I, the latter having abdicated in 1889. In January, 1898, ex-King Milan became Commander-in-chief of the army. The young King continued to govern the country in the style of an Oriental ruler, and at the beginning of the year postponed the meeting of the Skupschtina and decreed the budget. The people attributed the arbitrary regime to the influence of Milan, who seemed to be gaining an undue ascendancy in political affairs. A radical leader named Pashitch was placed on trial on a charge of *lese majesty*, and although he was acquitted on May 18, was again arraigned on June 2, and sentenced to imprisonment. The elections were held in June and resulted in the return of a Moderate Liberal majority in the Skupschtina; the Liberals numbered 114, Progressists, 62. This victory for the government was expected, for the elections were conducted under military supervision. There were rumors of a critical condition in Serbia where it seems that the Obrenovitch dynasty was rendered very insecure by the return of Milan. The state of affairs in Serbia as well as in the other Balkan states favored the plan for the reorganization of the Balkans under the leadership of Prince Nicholas, of Montenegro (see MONTENEGRO). After the government's success at the polls the King announced his determination to govern without regard to party, alleging that party rule had been responsible for the disorder in the state. A very stringent press law was passed in July. The Liberals were not ready to follow the government to all lengths in its high-handed policy and as the year advanced they showed unmistakable signs of opposition.

SERVICE MEN OF THE SPANISH WAR, organized in Lexington, Ky., Nov. 5, 1898. The society will have local camps, State camps, a national camp, and a ritual. Commander, Col. R. W. Leonard, Twelfth New York.

SEWAGE FARMING. See SEWAGE PURIFICATION.

SEWAGE PURIFICATION. The ultimate disposal of sewage depends upon a variety of local conditions. The foundation principle is that the sewage must not be allowed to pollute or threaten a public water supply, for it is to such pollution that most of our typhoid fever is due. Next to be guarded against is the creation of nuisances through the discharge of sewage where it will be unsightly or cause offensive odors. The increase of urban population and the growing appreciation of the beauty and value of pure streams and lakes are together causing strong efforts for more rational and scientific means of sewage disposal. Riparian owners have secured injunctions against stream pollution and collected damages for it in a number of instances within the past two or three years. Where sewage can be discharged into an ample volume of water, used for a public water supply, without causing a nuisance no better means of disposal could be asked. This was once considered almost criminal, on account of the alleged waste of valuable fertilizing material which it caused. The latest and best opinion holds that the discharge into water, under proper conditions, is no waste, because nature utilizes everything of value sooner or later. In this case, speedy utilization results through the various forms of animal and vegetable life in the water appropriating the sewage. Disposal by dilution, as this plan is called, has the great merit of cheapness, if suitable water is close by. Where a long and costly outlet sewer would be necessary to make this method available some form of artificial treatment may be preferable. Chemical precipitation, or the removal of suspended matter by the precipitating action of certain chemicals and by sedimentation, is now understood to effect only a partial purification, which may or may not be sufficient, depending upon local conditions. In any event, the precipitate, or sludge, remains for disposal. This is a very troublesome factor in the problem. The sludge is not in demand for fertilizing purposes,

as was formerly expected, although it is hauled away by farmers sometimes, if given to them without charge. The tendency is to mechanically press the sludge into "cakes," in order to reduce the moisture and bulk as much as possible, and then to burn it in furnaces. This is quite common abroad, but has been little practiced here as yet. In either intermittent filtration or broad irrigation the organic matter in the sewage is transformed to inoffensive mineral compounds by means of bacteria known as nitrifying organisms. Broad irrigation, or sewage farming, requires about one acre of land to each 100 inhabitants contributing to the sewerage system. Intermittent filtration accommodates ten times as many people on the same area. In either case less land is required if something short of complete purification, or the practical turning of sewage into drinking water, is required. The crops from some foreign sewage farms, notably those of Berlin, go far towards paying the cost of purification by this method. In this country but little scientific sewage farming has been attempted. This is partly owing to the high price of labor, especially of city employees. Obviously a city paying \$2 a day for labor is at a disadvantage when it must compete with market gardeners paying but \$1.35, the smaller sum perhaps being for a longer day. The most serious objection to sewage farming is the danger that the raising of crops will be placed above sanitary results. In the Western United States, where every drop of water is valuable, sewage has been used for irrigation rather than as a fertilizer. At present, intermittent filtration is the most approved method of sewage treatment in America. It consists of simple filtration of sewage through artificially prepared beds of sand, provided with collecting drains at the bottom. Such matter as accumulates at the surface is raked into heaps and carted off at intervals to be placed under land or disposed of in some other way. At the beginning of 1899 there were in the United States and Canada some 10 to 15 municipal chemical precipitation plants and 30 to 40 plants depending on land disposal, besides many works connected with public and private institutions. The best managed sewage filter beds in the United States to-day are those at Brockton, Mass. The best and largest chemical precipitation plant is at Worcester, Mass. The State Board of Health of Massachusetts has expended about \$28,000 a year for the past ten years in the study of the purification of sewage and water at its Lawrence Experiment Station. Valuable detailed results and discussions of these experiments are given in the annual reports of the board. In England, during the past few years, much has been claimed for the septic tank as a means of treating sewage. Such tanks are designed to exclude both air and light in order that the anærobic bacteria, or those living without air, may decompose the sewage. They are large enough to detain the sewage for 24 hours, and then only the partially clarified liquid flows away to filter beds. The sedimentary matters remain in the tank and are largely dissipated, it is claimed, through bacterial, chemical and gaseous changes. Another English idea, new at least in name, is the treatment of sewage in bacteria beds. These are modifications of intermittent filtration, but in some cases the aim is to increase the amount of air, and thus the work of the nitrifying organisms in the beds, and in others to exclude the air while the sewage is in the beds, then to introduce it freely, thus securing both anærobic and ærobic action.

SEWERAGE. One of the most marked tendencies in recent sewerage practice is the adoption of the separate, rather than the combined system; that is, the provision of two separate sets of conduits, one for house wastes, or sewage proper, and the other for rain-water and surface drainage. In the combined system, one set of conduits conveys both sewage and surface drainage. Where the combined system is already in use, as is the case in most of our large cities, changes to the separate system are rarely made, but nearly all the towns and small cities now installing sewers are putting in the separate system, and only a part of that; that is, they are building sewers for house wastes and postponing the storm sewers for later construction. The chief advantage of this course is its cheapness. It is especially desirable where the ultimate disposal of the sewage requires pumping, a long outlet sewer or purification, or a combination of these. In such cases it is of the utmost importance to keep the volume of sewage as low as possible. The rain-water and surface drainage require far more capacious conduits for their removal than the sewage proper and can often be safely discharged through short artificial channels into natural water courses.

It is becoming quite common to use large vitrified clay pipe in place of the smaller sizes of brick sewers. Pipe sewers 24 inches in diameter are largely used and 30 and even 36 inches are sometimes put in. The pipe sewers leak less than brick, have a greater capacity for a given size and, perhaps most important of all, are more easily kept clean. Perfect grade and alignment, the smoothest possible interiors, and sufficient slope to give self-cleansing velocity, are vital points in sewer design and construction. With these conditions fulfilled the sewage is hurried away from human habitations before offensive decomposition has time to begin. Thus no deposits or gases are allowed to form. On small sewers of gentle slope automatic flush tanks are used to prevent deposits. The tendency now is to make these flush tanks of 200



1



(From *Engineering News*)

2

VIEWS OF SEWAGE FILTRATION AREA, PLAINFIELD, N. J., IN OPERATION, FALL OF 1911. Fig. 1. View from the east, looking west. Fig. 2. View from the east, looking west, with lime, ready for raking. Fig. 3. Bed No. 12; raking off sludge deposit.



3



4

—Fig. 1. Bed No. 6 flooded with sewage. Fig. 2. Bed No. 4; sludge deposit sprinkled
 (ore deposit than usual.) Fig. 4. Bed No. 16; harrowed and ready for flooding.

or 300 gallons capacity per discharge, rather than 150 gallons, as formerly. Properly constructed sewers rarely need any ventilation other than that provided by perforated manhole covers. Ventilating shafts and chimneys are sometimes provided abroad, but generally on poorly built sewers, and practically never in America. Where it is desirable to lower a high ground water level to render adjacent land more habitable, or to prevent the infiltration of ground water into the sewers, under-drains, either of agricultural drain tile or sewer pipe with open joints are laid in the trenches beneath or along side the sewers. These are of great value where the sewage must be pumped or purified, since they tend to diminish its volume. As another means of serving this same end, sewer pipe is now being made in $2\frac{1}{2}$ or 3 ft. lengths, instead of 2 ft., and with extra deep sockets, or jointing spaces at the ends. The greater length of pipe decreases the number of joints which, with the increased depth of sockets, decreases the leakage.

In most sewage systems the flow is maintained by gravity. Where artificial means are necessary to lift the sewage, ordinary pumps, sometimes with modifications to prevent clogging, are employed, or compressed air may be used. The latter may be supplied from a central station to a number of sub-stations, where automatic devices for lifting the sewage are placed. Quite recently devices have been installed by which the sewage lifts itself, somewhat on the principle of the hydraulic ram. See DRAINAGE, SANITARY LEGISLATION and SEWAGE PURIFICATION.

SEWER GAS. The sewer gas scare has doubtless served an admirable purpose in directing popular attention to the value of good plumbing. It is now pretty well understood, however, that there is no specific sewer gas, though improperly constructed sewers give rise to the development of many kinds of gases. Extended researches, supplemented by the latest facts regarding disease germs, show that there is far less likelihood than was formerly supposed of the spread of specific diseases by sewer air. To be so spread, the germs must float, and to float they must get into the sewer air after considerable drying. Sewers are damp and consequently there is little chance for germs from the sewage to float in sewer air. The chief danger from such air is similar to that from other impure air, such as that of poorly ventilated churches and theaters; it tends to general debility and greater susceptibility to disease.

SHAFTER, WILLIAM RUFUS, Major-General, U. S. V., was born in Michigan and is about sixty-three years old. He had no experience of military life until he entered the Union service as a First Lieutenant in the Seventh Michigan Infantry, August, 1861. He served throughout the war with credit and was promoted; was brevetted Colonel for gallantry at the battle of Fair Oaks and in March, 1865, was brevetted Brigadier-General of volunteers for meritorious services during the war. In July, 1866; he was appointed to the regular army as Lieutenant-Colonel of the Forty-First Infantry, and in March, 1879, was promoted to the Colonelcy of the First Infantry, in which position he remained until May, 1897, when he was commissioned Brigadier-General and was assigned to the command of the Department of California, with headquarters at San Francisco. He has a good record for services rendered in Indian campaigns in the far West, and especially in Texas and New Mexico. On May 4, 1898, General Shafter was nominated by President McKinley to be a Major-General of volunteers, and was subsequently placed in command of the Fifth Army Corps, consisting of about 16,000 men, which on June 16 embarked from Tampa, Florida, bound for Santiago de Cuba. See SPANISH-AMERICAN WAR.

SHAKERS. This communistic society, whose official designation is the United Society of Believers in Christ's Second Appearing, has received the name Shakers from the rhythmical movements of the hands and arms which form part of their worship. The Shakers originated in England, but their colonies are now found only in the United States. The Shakers number 16 churches and 1,650 members. They comprise some fifteen societies and each society is composed of several families. These Shaker societies are in Massachusetts, New York, New Hampshire, Maine, Connecticut, Ohio and Kentucky. Their largest community, consisting of about 225 persons, is at Mount Lebanon, N. Y. The Shakers are now making plans to colonize in Georgia (q. v.).

SHALE. While it is not possible to give statistics of the actual amount of shale used in 1898, or any other year, still attention can be called to the greatly increasing use of this material, especially in the clay-working industry. The statistics of production of sewer-pipe, paving brick, and roofing tile (see CLAY), which are almost exclusively made of shale, give an excellent idea of its increasing usefulness. New beds of shale are continually being discovered and exploited. See also MINERAL PAINTS.

SHARP, WILLIAM, essayist, born in Renfrewshire, September 12, 1856. He was educated at the Glasgow University, and went to Australia. In 1879 he devoted himself to literary work in London. Mr. Sharp is the author of *The Human Inheritance*

(1882); *The Earth's Voices* (1884); *Romantic Ballads* (1886); *Sospiri di Roma* (1891); *Flower o' the Vine* (1894); many biographies and essays, and *Wives in Exile*, a comedy in romance (1898).

SHARPE, MRS. FRIDA STEPHENSON, who had gained some prominence as a writer upon life and literature in Iceland, died at her home in Chicago, November 6, 1898. She was born at Reykjavik in 1861. Mrs. Sharpe made frequent contributions, both in prose and verse, to the magazines. She was the author of a play written in Icelandic, which was produced by members of the Icelandic colony in this country. Shortly before her death she finished a translation of Kielland's novel, *Jakob*.

SHAW, BERNARD, author and dramatist, born in Dublin, July 26, 1856. In 1876 he settled in London, where he has acquired a reputation as a journalist, critic, platform speaker, political pamphleteer and play-wright. His plays include: *The Arms and the Man* (1894), and *The Devil's Discipline* (1897); four novels, *The Irrational Knot*, *Lore Among the Arists*, *Cashel Byron's Profession* and an *Unsocial Socialist* (1880-83). He has also published *The Quintessence of Ibsenism* (1891); *Plays, Pleasant and Unpleasant* (1897); and *The Perfect Wagnerite* (1898).

SHELDON, CHARLES L., ex-Governor of South Dakota, died at Deadwood, October 20, 1898. He was born at Johnstown, Vermont; served in the Civil War; went to Dakota in 1881, and was elected Governor in 1892 and 1894.

SHELLEY'S POEMS. In the fall of 1898 it was announced that the lost volume of Shelley's youthful poems had been discovered at Dorchester, England. The fact that such a volume had existed was discovered in 1859 by Dr. Richard Garnett, who found in the British Museum an account of Shelley's dealings with Stockdale, in the latter's *Budget*. It seems that when barely eighteen Shelley, together with some collaborator, had published a volume through Stockdale, the edition being limited probably to less than one hundred copies. Being subsequently informed by Stockdale that the collaborator had plagiarized one of the poems from Matthew Gregory Lewis, Shelley suppressed the edition. From 1859 until 1898 admirers of Shelley have sought for these poems, and now that the volume is found it can only be said that curiosity is satisfied, for the little book can neither add to nor detract from the lasting fame of Shelley's wonderful genius. It is thought by Dr. Garnett, who undertook to publish the poems, that the coadjutor, who was formerly thought to be Harriet Grove, was Shelley's sister Elizabeth. As to the alleged plagiarism, Dr. Garnett thinks that there is a purloined poem in the collection, but that it was not stolen from "Monk" Lewis. The verses attributed to the sister are such as almost any clever school-girl could compose, and in those of Shelley there is little that is striking and almost nothing suggestive of the master poems that appeared only a few years later. The volume is made up of two epistles in the style of Anstey's *Bath Guide*, evidently written by Elizabeth; a series of little love poems, written by Shelley to Harriet Grove; four stories of terror in the Monk Lewis style; and four miscellaneous pieces, two of which are translations. *Literature* commented: "Shelley's part of the book may be said to range in merit from the level of the Monk Lewis, Anne Radcliffe pieces, where we get such verses as,—

I must, dearest Agnes, the night is far gone—
I must wander this evening to Strasburg alone,
I must seek the drear tomb of my ancestors' bones,
I must dig their remains from beneath the cold stones,

to that of the love poems, of which this is a fairly typical stanza:

Come (Harriet)! sweet is the hour,
Soft zephyrs breathe gently around,
The anemone's night-boding flower
Has sunk its pale head on the ground.

There is nothing very striking here, no doubt, but it has just begun to be poetry, which the other has not approached. In fact, we find the love pieces a little more characteristic of Shelley than Dr. Garnett would allow. Is there not just a faint suggestion of the later Shelley in such a line as, 'But spirits of peace steep her slumber in dew,' or in another about the 'stern wreck of nature?' The poems were written when Shelley was about seventeen, and chronologically, they are the second of his works, the romance *Zastrozzi* being the first. Their only present value lies in the fact that they throw some light on Shelley's earliest relations with Harriet Grove. It is to be hoped, however, that they will arouse a wider public interest in Shelley's poetry—a poetry of aspiration—and in Shelley himself, who, doubtless has a place among the first half-dozen English poets.

SHERMAN, JOHN, one of the foremost American statesmen during the last third of the century, retired from public life upon his resignation of the portfolio of State in the McKinley cabinet in April, 1898. He was born in Lancaster, Ohio, May 10, 1823. Having received an academic education, he studied law and was admitted to the bar in May, 1844. He was a delegate to the national Whig conventions of 1848 and 1852, and represented his district in the Thirty-Fourth, Thirty-Fifth, Thirty-Sixth and Thirty-Seventh Congresses, being the Republican candidate for speaker in the winter of 1859-60. In March, 1861, he entered the United States Senate, and was reelected in 1866, 1872, 1880, 1886, and 1892, being president of the Senate from December 7, 1885, to February 26, 1887. In March, 1877, he was appointed Secretary of the Treasury; he superintended the resumption of specie payments, which took place January 2, 1879. In 1880 and 1888 he was a prominent candidate for Presidential nomination in the Republican national conventions. Mr. Sherman resigned his seat in the Senate to become President McKinley's Secretary of State, and his appointment was confirmed March 5, 1897. On account of the weakness due to advanced age, he was able to perform but little more than the formal functions devolving upon his office, and upon the outbreak of the troubles with Spain he accordingly resigned and was succeeded by the Assistant Secretary, Judge William R. Day, who had already practically been the head of the department. Mr. Sherman's name is inseparably connected with the history of American politics and finance; in his retirement and old age he has accorded him the honor and respect of the nation.

SHIRAS, GEORGE, JR., Associate Justice of the Supreme Court of the United States, was born in Pittsburg, Pennsylvania, January 26, 1832. After being graduated at Yale College, in 1853, and after studying during the following year in the Yale Law School, he was admitted to the Pennsylvania bar in 1856. He practiced his profession in Pennsylvania up to the time of his appointment to the Federal court to succeed Justice Joseph P. Bradley; Mr. Shiras was appointed by President Harrison in July, 1892, and took the oath of office on the tenth of the following October. In 1883 he received the degree of LL. D. from Yale University; in 1888 was one of the Pennsylvania presidential electors.

SIAM, the chief state of Indo-China, with an area formerly estimated at 300,000 sq. m., but since the large acquisitions by the French, between 1893 and 1894, about 200,000 sq. m., and with a population estimated at 5,000,000, although some authorities place it as high as 12,000,000. A United States Consul's report, published in 1898, however, gives what he considers the true figures as about 8,000,000 for the population, and he says that the area is about 250,000 sq. m. Its capital is Bangkok, with about 200,000 inhabitants, according to most authorities, but the Consular Report, above mentioned, states that it is estimated at from 600,000 to 800,000 and is rapidly increasing. Agriculture is the main occupation, and the chief crops are rice and sugar. The exports consist mainly of rice, teak-wood, oxen, pepper and hides. The trade is chiefly in the hands of foreigners, and the British have the largest share. The centre of foreign trade is at Bangkok, which is an exceedingly progressive city for the Orient, having an electric street car system, electric lights, telephones, telegraphs, railroads, hotels, libraries and banks. It has a good harbor in the river Menam, with an abundance of water. The banking facilities are excellent and trade is well organized. It is the distributing point and market for a region inhabited by fully 5,000,000 people. It is in regular steamship communication with Hong-kong, 1,200 miles distant, and with Singapore, 850 miles distant. Trade is not impeded by customs tariffs and port regulations, the average import duty being only 3 per cent. ad valorem, except on wines, on which it is 5 per cent., on the average. There are said to be excellent trade opportunities in Siam for American merchants. Of the Asiatic countries Siam ranks next to Japan in its receptiveness toward new and progressive ideas. The king, Chulalongkorn I, seems to be regarded with the highest respect, both by foreigners and natives.

Several railways have been projected and some are already completed. The first line was opened in April, 1893, between Bangkok and Paknam and in 1897 work was begun on a line 163 miles long between Bangkok and Khorat. This latter line was expected to be completed by the close of the year 1898. The total mileage opened for traffic in 1897 was only 58. In 1897 the king paid a visit to European countries, and after his return, in a speech, which he made on January 3, 1898, in response to an address of welcome, declared his intention to promote the welfare of the country and remove existing abuses.

SIBERIA. The statistics of commerce, population, etc., for Siberia are included in the article RUSSIA (q. v.). The present article deals only with certain aspects of internal development, which were referred to in the United States Consular Reports of 1898. The great commercial importance of Siberia lies in the part which it has played for several generations in supplying Europe with bread-stuffs—a part which seems likely to become still more important upon the completion of the great Trans-

Siberian Railway, now in process of construction. The possibility of cutting off some of the markets for the American wheat producer as a result of the improved means of communication between Siberia and the East gives especial interest to the condition of the production of cereals in that country. The cultivation of wheat is most important in the extreme South and Southeast, where from one-third to one-half of the acreage under crop is sown with wheat. The Trans-Siberian Railway, however, does not drain the wheat-growing region. Most of the wheat fields are in the regions tributary to the great seaports and are already within easy access of the market. Moreover improvement in internal conditions will no doubt result in a larger consumption and better adjustment of the wheat supplies within Russia itself, for at present it often happens that certain localities in Russia suffer for the lack of bread-stuffs at a time when other localities have a surplus. For instance, it is pointed out by the American Consul that a surplus of grain in the Yeniseisk or even in the Tomsk government cannot supply a deficit in the government of Tobolsk. The effect of the railway therefore will be rather to equalize this surplus and improve internal conditions in respect to trade than to affect the markets of the world. The leading crop in Russia is rye and the next is oats, wheat occupying the third place among the cereals. For these reasons it is said that the extension of the Trans-Siberian railway will not result in an increased exportation of Russian wheat. Not only does the surplus in Western Siberia go to supply the deficit in the rural districts, but it is not likely to reach the frontier, because of the high freight rates.

SICILY, EARLY CIVILIZATION OF. See **ARCHÆOLOGY** (paragraph Italy).

SIERRA LEONE, a British possession on the west coast of Africa, includes the island of Sherbro with adjoining territory, and extends from the border of Liberia, in the south, to the Skarcies river in the north. It has an area of from 15,000 to 30,000 sq. m., and a population variously estimated at from 180,000 to 750,000. The diversity in the estimates arises from the very rapid expansion of the territory since 1891. At that time the population was placed at about 75,000 and the area of Sierra Leone proper was only 4,000 sq. m. In 1898 some authorities gave the area as 30,000 sq. m., while the black population is said to be eight or ten times as great as it had been in 1891. The capital is Freetown, with a population, in 1898, of about 40,000, which is one of the chief trading centres in West Africa. Few cities show such a variety in population, since it is said that in Freetown alone sixty distinct dialects are spoken by the inhabitants. Although this city is still regarded as the chief seaport in West Africa, its trade has declined of late on account of the trouble in the colony and the activity of the French in the neighborhood. The chief products of Sierra Leone are palm oil and kernels, benni seed, kola nuts, India rubber, ground nuts, copal, and hides, and these constitute its chief exports. As to the religion professed in the colony, the native blacks are still, for the most part pagans, but there were in 1891 nearly 41,000 Protestants, 7,396 Mohammedans and 571 Catholics. Freetown is the seat of the Sierra Leone episcopate and the starting point of much missionary work. Higher education is represented by the Fourrah Bay College, which is affiliated to the University of Durham, and there are a considerable number of elementary schools and high schools. The government is carried on by a Governor (Sir Frederick Cardew, in 1898), aided by executive and legislative councils. There is a Frontier Police Force established for the purpose of maintaining order. At the time of its organization in 1890, it was 300 strong, but in 1898 it was largely increased in consequence of the trouble with the natives.

History.—A good deal of comment, including some criticism, which was most unfavorable to the administration of the colony, was occasioned by the troubles between the natives and the authorities, in the spring of 1898. This trouble is said by some to have originated in the harsh treatment of the natives by the colonial administration during many years. Since the year 1888, when Sierra Leone obtained separate existence as a colony, there has been a steady widening of the British sphere of influence, brought about, it was said, by the necessity of keeping pace with France. Even before that date the desire of excluding French rivals had led the British to assume control over the regions north of Freetown as far as the Skarcies river and over the tribes lying to the east of the former limits of the colony. This policy was continued under succeeding governors, especially under the administration of Sir James Hay, who was appointed in 1888. The latter's successor, Sir Francis Freeling, though opposed to the aggressive policy of his predecessor, remained in office too short a time to undo it and with the appointment of Sir Frederick Cardew, in 1892, the activity of the administration was renewed, with a result, as some critics say, of further trouble with the natives and injury to trade. The work of subjugating the tribes of the interior went on and was in the main conducted by means of savage troops, who were recruited for the frontier police force from refugees. There has been much criticism of the character of these troops, who are said to practice all sorts of atrocities upon their kinsmen, and to exercise a terrorism and despotism worse than the natives had ever suffered from their chiefs. However this may be it is

certain that the colony has been the scene of much cruelty and rapine. Under Sir Frederick Cardew the power of the frontier police was increased. It was said by the opponents of the administration that the constables in the native districts exercised their authority in the most despotic way, showing not the least regard for the interests of the natives. In September, 1896, a Protectorate Ordinance was passed to promote peace, order, and good government in the territories adjacent to the colony of Sierra Leone and this measure was reenacted in September, 1897. Among its clauses was one that imposed a "house tax" of five shillings a year (ten shillings in the case of houses of four rooms or more) on all house-holders, to be paid in sterling coin. No attempt was made to enforce this act until January, 1898. It met with violent opposition from the natives. The tax is said to have been exorbitant in consideration of the wretched character of the little mud hovels of the natives, which were worth hardly more than two or three shillings apiece. Moreover, the natives handled sterling coin very rarely, being paid for the most part in kind. The effort to collect the house tax, combined with other grievances, real or imaginary, on the part of the natives, led to a very serious revolt early in the year 1898. The details of this little war are not available at the present time, but the general outline of events is as follows: In most cases the natives did not produce the sterling coin in payment of the hut tax. They claimed to be loyal to the government and said that they did not pay because they had not the money. Their excuses were not accepted. A detachment of the West India regiment, which is quartered at Freetown, was sent into the districts where the commissioner was having the greatest difficulty with the natives. On the third of March, 1898, the colony's troops took the town of Karina and killed some sixty of the natives. Another engagement at Port Lokko, March 5, resulted in the loss of forty more of the natives. The authorities now strengthened their forces and were apparently gaining ground when the rainy season interrupted the military operations. By the summer of 1898 the revolt was apparently crushed out. So far as the collection of the tax is concerned, the government's attempts seem to have resulted in failure, for nearly all of the huts which it was proposed to tax, were destroyed. The injury to trade has been serious and the loss of life considerable, though it has for the most part been on one side only, that of the natives. In May, fugitives began to throng the city of Freetown on account of the rumor of a plot to massacre the Sierra Leone residents. This plot was actually carried out and it was said that between one and two hundred persons were killed in the districts along the coast. The massacre included natives as well as Europeans and seems to have been carried out in a spirit of blind vengeance in which the blacks killed many who had done them no wrong. The hut tax, though one of the chief causes, was by no means the only cause of these troubles, for the natives had long been determined on vengeance for what they regarded as the terrorism and cruelty of the frontier police. How far the authorities have been to blame for these matters can not accurately be determined. In 1898 the British Foreign Office sent out a special commissioner, Sir David Chalmers, to investigate the causes of the trouble.

SIGSBEE, CHARLES DWIGHT, Captain, U. S. N., was born in Albany county, New York, in 1845. He entered the United States navy in 1859 as an acting midshipman; in 1862 was made midshipman, and the following year ensign; he became master in 1866, Lieutenant in 1867, Lieutenant-Commander in 1868, and Commander of the Hydrographic Office in the Bureau of Navigation at Washington. He was made Captain in 1897, and was in command of the United States battleship *Maine* when she was blown up in Havana harbor, February 15, 1898. The coolness that Captain Sigsbee showed at this time and his dispatch asking the American people to "suspend judgment" until the causes of the disaster had been determined by proper investigation, did much to allay, or, at least, to postpone popular resentment. After the official reports had been made—those of the Naval Court of Inquiry and the Senate Committee on Foreign Relations—Captain Sigsbee for a time acted as aid and advisor to the Secretary of the Navy. In April, 1898, he was appointed to the command of the steamship *St. Paul*, which had been converted into an auxiliary cruiser. See SPANISH-AMERICAN WAR.

SILCHESTER, EXCAVATIONS AT. See ARCHÆOLOGY (paragraph England).

SILK MANUFACTURES. The silk industry for the year 1897 was much more satisfactory than the year previous, owing to the smaller production and the increased demand for silk goods. Very fortunately for American silk manufacturers this demand was for such qualities as they could produce. The Commercial Year Book states that the value of manufactures of silk imported for the fiscal year ending June 30, 1897, was \$25,199,067, against \$26,652,768 preceding year. The chief articles imported were as follows:

	1896-97.	1895-96.	1894-95.	1893-94.
Piece Goods	\$7,576,001	\$12,538,449	\$14,910,710	\$11,481,041
Ribbons	963,969	1,302,818	1,287,952	1,188,392
Laces	2,157,927	2,379,688	2,173,659	2,108,646

During the calendar year 1898 the United States imported silk manufactures (dutiable) to the value of \$25,284,641 of which more than two-fifths came from France and more than half from France and Germany alone. The exports of silk manufactures during the year amounted to \$308,060.

The quantities of silk raised for export during the two years, 1896-1897 are given by countries in the following table (figures are in pounds) :

Country.	1897.	1896.
France	353,800	355,028
Italy	1,720,675	1,399,682
Spain	46,360	46,762
Austria-Hungary	124,850	133,930
Asiatic Turkey	316,450	404,060
European Turkey	70,370	74,900
Bulgaria and Roumania	16,344	22,700
Greece	19,068	18,160
Caucasia	83,990	111,230
Persia	13,620	18,160
*China—Shanghai	1,927,684	1,670,526
China—Canton	703,700	705,516
Japan	1,548,140	1,330,220
India	144,360	154,360
Total	6,790,024	6,445,234

SILVER, Production.—The domestic production of silver in 1898 was 64,060,000 troy oz., as against 56,457,292 troy oz. in 1897, the increased output being due to a greater production of silver-bearing lead and copper ores, from which the silver is obtained as a by-product. The total production of silver from domestic and foreign ores by American refiners was :

1897	96,776,068 Troy oz.
1898	106,068,726 Troy oz.

Metallurgy.—The processes belonging to the metallurgy of silver alone are of comparatively little importance at the present day, for so much is obtained as a by-product from the smelting of lead and copper ores, these furnishing about one-half of the silver supply in this country. Little silver is now produced in the United States by amalgamation or lixiviation, and still less in foreign countries.

SIMPKINS, JOHN, Republican member of Congress from Massachusetts, died March 26, 1898. He was born in New Bedford, Mass., June 17, 1862; was educated at St. Mark's School, Southboro, and at Harvard College, at which he was graduated in 1885. He was a Massachusetts State Senator, 1890-91, and was elected to the Fifty-fourth and Fifty-fifth Congresses.

SINGERLY, WILLIAM M., editor and proprietor of the Philadelphia (Penn.) *Record*, was born in Philadelphia, December 27, 1832, and died in that city February 27, 1898. In 1850-60 he was engaged in business, subsequently assisted his father in the management of street-car lines, established in 1868 a business in Chicago, and was ruined by the fire of 1871. Returning to Philadelphia, he became manager of the Germantown Passenger Railroad Company, a part of the stock of which—15,000 shares—came into his possession upon the death of his father, in 1878. This stock, which was appraised at \$750,000, he sold for \$1,500,000. In 1877 Mr. Singerly bought the *Public Record*, and, changing its name to the *Philadelphia Record*, soon made the paper a great success. He established a paper mill at Elkton, Maryland, to supply his presses. He was engaged in a large number of other enterprises; he built hundreds of houses, at one time owned the Empire Theatre (burned in 1886), became president of the Chestnut Street National Bank and of the Chestnut Street Trust and Savings Fund Company, was interested in the Brighton Mills, a dry goods store, a gleaner and binder factory, an engraving company, and in farming and stock raising. He was an active Democrat; he ran for Governor in 1894, but was defeated by General Hastings; in the presidential campaign of 1896 he supported Palmer and Buckner, the Democratic "Gold" candidates.

SIRIASIS. See HEATSTROKE.

SISTERS OF CHARITY OF ST. VINCENT DE PAUL (Filles de la Charité), were founded in Paris in 1633 by St. Vincent de Paul, and Mlle. Louise le Gras. They are governed by a mother general, who resides in Paris. The Sisters of Charity

*This includes about 216,920 lbs. of wild silk.

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markets, and in this they have been so very successful, that a stock-yard has been established in London. The foreign producers have made strong attempts to check this invasion, but thus far have not been very successful. It is estimated that in 1898, 290,000 squares of slate were exported. Most of this went to Great Britain, but other countries supplied were Australia, Germany, Belgium, Denmark, Sweden, Norway, South America, South Africa, and China.

SLEEPING SICKNESS. Among the inhabitants of tropical West Africa appears an epidemic disease called sleeping sickness, or negro lethargy, lasting four months or as many years in some cases, and characterized by periods of sleep recurring at short intervals. The sufferer appears at first languid, weak, pallid and stupid. His eyelids become puffy; an eruption appears on his skin. He falls asleep while talking, eating or working. As the disease progresses he is fed with difficulty and becomes much emaciated. He lies about in the sun or in his hut, indifferent to surroundings. The failure of nutrition and the appearance of bed-sores are followed by convulsions and death. Some patients become insane. Dr. Patrick Manson suggested the *filaria perstans* as the cause of the disease. Recently Cagigal and Lepierre, of Coimbra, have isolated a bacillus which they believe to be the cause. Inoculations into rabbits of a culture of this bacillus caused similar symptoms to those exhibited by a young negro affected with sleeping sickness from whose blood they removed this bacillus for cultivation. Some cases of the disease have developed in Congo negroes seven years after they have left Africa for a permanent residence in Europe. A few cases of the disease have been found among negroes in our Southern States. See MUCIN PRODUCED BY BACTERIA.

SMALLPOX. See PUBLIC HEALTH.

SMELL, SENSE OF. See PSYCHOLOGY, EXPERIMENTAL (paragraphs University of Iowa and Cornell University).

SMITH, CHARLES EMORY, was appointed by President McKinley April 21, 1898, to the position of Postmaster-General, which had been made vacant, April 18, by the resignation of Mr. James A. Gary on account of ill health. Mr. Smith's nomination by the President was unanimously confirmed. Born in Mansfield, Connecticut, in 1842, Mr. Smith received his education at the Albany (New York) Academy and at Union College, Schenectady, New York. After the Civil War, when he served under General Rathbone and Governor Morgan in recruiting regiments, he returned to Albany and edited the *Express* (1865). Five years later he became joint editor of the *Albany Evening Journal*, and in 1877 its sole editor. In 1878 the legislature elected him a Regent of the University of the State of New York. For a number of years he was a member of State Republican conventions, and, from his office as chairman of the Committee on Resolutions, he had much to do in framing party platforms. Having removed in 1880 to Philadelphia to become editor of *The Press*, he soon became actively engaged in Pennsylvania as well as national politics. He advocated Blaine's nomination in 1884. President Harrison sent him in 1890 to St. Petersburg as Minister to Russia, where he remained until his resignation two years later. During this time he took an active part in giving relief to the sufferers in the great famine that prevailed in Russia in 1891-1892. Mr. Smith has been an active campaign speaker. It is supposed that much of the Republican national platform of 1896 was written by him.

SMITH, JOSEPH P., Director of the Bureau of American Republics, died in Miami, Florida, February 5, 1898. He was born at West Union, Ohio, August 7, 1856. He had been editor of the Urbana (Ohio) *Daily Citizen* and of the Toledo *Commercial*, and in 1892-96 was State Librarian.

SMITH, RICHARD, journalist, died at his home in Cincinnati, Ohio, April 22, 1898. He was born in county Wexford, Ireland, January 30, 1823; received a common school education and came to the United States in 1841 and went to Cincinnati; worked at the carpenter trade as an apprentice for about three years and then engaged in newspaper work on the Cincinnati *Daily Chronicle*. He became connected with the Chamber of Commerce upon its organization in 1845 and four years later was appointed Superintendent, at which time he bought the *Price Current*. He wrote commercial reports for the Cincinnati papers and financial articles for the *Gazette*; in these years he worked from sixteen to eighteen hours a day. Mr. Smith bought an interest in the *Gazette* in 1854, to which paper two years later he was enabled to give his whole attention as he resigned the superintendency of the Chamber of Commerce and sold the *Price Current*. In 1883 the *Gazette* was consolidated with Murat Halstead's paper, the *Commercial*, and was called the *Commercial-Gazette*, Mr. Smith being its business manager. In 1891 he resumed editorial work. He was a director for many years of the old Western Associated Press and at the time of his death was a member of the Cincinnati Board of Supervisors. He had exercised a marked influ-

ence in Republican politics and for many years was a leader of public opinion in the middle west.

SMITH COLLEGE, in the city of Northampton, Massachusetts, was chartered in 1871, and opened for instruction in 1875. It is non-sectarian and for women only. Three regular courses, each four years in length, are offered, the classical, the scientific, and the literary, leading respectively to the degrees of bachelor of arts, bachelor of science, and bachelor of letters. There are also schools of music and art, and courses in these branches may be elected by members of the regular academic departments. The number of electives offered in the academic department increases as the course advances. For the year 1898-99 there were 53 resident officers of instruction; the student enrollment was, graduate students, 4; seniors, 192; juniors, 230; second class, 305; first class, 343; school of music, 14; school of art, 18; total, 1,104. 148 students in the academic department received instruction in music; of the class graduated in June, 1898, 71 were candidates for the degree of A. B.; 69 for B. L.; 7 for B. S.; 3 for B. M., and two for art diplomas; there were 2 candidates for the degree of A. M. The library contains only about 6,000 volumes, but the students have access to the public library of Northampton and to the magnificent Forbes library, situated directly opposite the college grounds. Among other gifts to the college in 1898 was the sum of \$50,000 toward the erection of a new building which will provide additional lecture rooms and suitable accommodations for a reference library. The rooms of this building will have a total seating capacity of 1,481, and a library capacity of 44,000 volumes. The plan of the building is similar to the plans of the Congressional and Columbia University libraries, and it will be erected at a cost of \$100,000. It was expected that the building would be ready for use in the fall of 1899. The President is Rev. L. Clark Seelye, D. D., LL. D.

SMITHSONIAN INSTITUTION. See ANTHROPOLOGY.

SNAKE BITE. See SERUM THERAPY.

SNOW, LORENZO, Mormon elder, who succeeded Wilford Woodruff (q. v.) in 1898 as head of the church, was born of New England parents at Mantua, Portage county, Ohio, on April 3, 1815, and was ordained as a Mormon apostle on February 12, 1849. Mr. Snow, who is an Oberlin man, and is recorded as having been one of the best students in college, has been one of the pillars of the Mormon church, and at one time went to Europe as a Mormon missionary with Wilford Woodruff. His sister, Eliza Snow, was one of the most noted women among the Mormons. Convicted for polygamy under the Edmunds law in 1886, he received the offer of a pardon on condition that he would abandon the system, but he refused and was sentenced to eighteen months imprisonment. He obtained his release, however, in less than a year. In an interview a few days after his accession to the presidency he professed his belief in the revelation given Joseph Smith on celestial marriage, but said that he did not think that it would be right to break the laws of the land against that practice, and that he would not change the inhibition of President Woodruff's manifesto; and he added that polygamy existed in Utah neither secretly nor openly. In this he referred, however, chiefly to alleged polygamous marriages contracted since 1890, for in regard to polygamous relations that began before that date he used the same arguments and brought forward the same pleas as did Mr. C. W. Penrose quoted in the article on Wilford Woodruff.

SNOW REMOVAL. See STREET CLEANING.

SOAPSTONE. In Northern Africa is found a peculiar soapstone called by the natives "tfol," which contains free gelatinous silica and is largely used by the Arabs as a substitute for soap in the washing of linen. Lahache, who has called attention to this substance, finds that it has great capabilities of mixing with oils, one part completely absorbing five parts of heavy tar oil. When the compound is mixed with water a perfect emulsion is formed which does not adhere to the sides of glass vessels. It is proposed to use this earth for emulsifying heavy tar oil for disinfecting purposes. For this purpose the "tfol" is first mixed with an equal weight of water, and then intimately incorporated with sufficient heavy tar oil to make a paste.

SOCIAL DEMOCRACY OF AMERICA. An organization founded in Chicago, Ill., in June, 1897, as the successor to the American Railway Union, which was dissolved at that time. The leader in the establishment of the new society was Eugene V. Debs, the former President of the American Railway Union. The declared purpose of the new organization was "to unite all persons who are in favor of the coöperative commonwealth, as a substitute for the present competitive system." This coöperative commonwealth, according to the purposes set forth in its constitution, was designed to spread the influence of socialism, unite the people in a socialistic organization and found coöperative colonies and industries. By concentrating these coöperative communities in a single State and resorting to every device for increasing their prosperity and popularity, it was hoped that the people of the entire State might be "socialized." The details of the scheme show an

optimistic disregard of the failure of similar schemes in the past. It was proposed to send out picked men as pioneers to some western State where they should found a community in which diversification of industry should exist from the start. The means of production were to be held in common and the members of the community should receive as a remuneration for their work not money but labor checks. The ultimate purpose of the colony was to get control of the State organization by means of the ballot and so far as it was compatible with the laws, frame a constitution embodying coöperative principles. They thought that the successful example of a State thus organized would influence other States to adopt the same plan and it was hoped that eventually the whole Union would consist of such communities organized on this coöperative basis. It was seen that at first the colonists could not be self-supporting and contributions were levied on all the members of the Social Democracy of America in order to pay the expenses of the experiment. Some active work was done in organizing new branches and propagating the doctrines of the society. In 1898 at the annual convention held in Chicago on June 11, there was a split in this organization. Mr. Debs and the representatives of sixty-four branches, with a membership of some 2,000, withdrawing from it. The cause of the division was the refusal of the majority to declare in favor of political action exclusively. The Debs contingent formed a separate party under the name of the Social Democratic Party of America. Its platform besides the reforms advocated by the former party, included a demand for active political work to realize the ends desired. Among the features of both platforms are the public ownership of railroads, telegraph, telephone, means of transportation and communication, water works, gas, and electric plants and all other public utilities; the establishment of a system of public works for the relief of the unemployed, the control of mines and oil wells, etc.

SOCIALISM. The present article gives a brief account of the socialistic parties in the leading countries.

Germany.—Some account of the present political status of the Socialists is given in the article German Empire (q. v.). In that country they are known as Social Democrats and their best known leaders are Liebknecht and Bebel. Other prominent leaders are Heine, Vollmar and Singer. The cardinal principle of their organization is the replacement of the present individualistic ownership of capital by a system in which all the means of production will be owned by society as a whole and worked for its benefit. In other words, they aim at what is known as the socialization of the means of production. In 1898, 2,120,000 votes, or 30 per cent. of the total, were polled for candidates of this party and it is to-day the strongest political party in the Empire. The increase of the party in recent years has been remarkable. Since 1893 it has gained 334,000 votes. State socialism finds no support among them since they regard it as a half-way measure and offered merely as a bid for popular support against them.

The Social Democrats are divided into two groups, the revolutionists and the moderates. The former comprise the followers of Karl Marx and the survivors of the movement of 1848. They teach as a fundamental principle that capital is acquired by the sopliation of labor and they accept the theory of surplus value. They aim not only at convincing the people of the desirability of such reforms as the eight-hour work day, the minimum wage and the abolition of child labor, but at the complete overthrow of private property and the emancipation of the wage-earner. They do not openly declare in favor of a sudden and violent revolution, but they seek to realize their ideals so far as circumstances will permit. Their immediate aim is to control the government, after which they propose to accomplish their reforms by legal means. On the other hand the more moderate members of the party, though accepting socialistic doctrines, are opportunist in spirit. They occupy themselves with practical problems and have less to say about the dogmas of Karl Marx. They do not think that the laws of the society of the future can be determined in advance. They would have the party increase and gain strength so far as possible, and they favor a more compromising attitude. After the elections of 1898 the Social Democrats comprised 18.4 per cent. of the total membership of the *Reichstag*. In order to control the government they would have to gain 143 votes, their number in 1898 being 56, and the total for the *Reichstag* 397. Leaders of the moderate party like Vollmar and Heine do not think that the time is near at hand when these additional votes will be secured. They think the party should recruit itself by appealing to wider classes of the workingmen and propose immediate and practical reforms without dwelling upon the end which the movement has in view. They think that the party should make proposals looking to the redress of practical grievances and say less about the suppression of private property, for it is pointed out that the condition of the workman in Germany has improved, owing to the steadiness of employment, the advancement in industry and the systems of inspection, insurance and pensions, which have been introduced and organized by the state. At the beginning of October, 1898, the Social Democracy held its annual congress at Stuttgart. It was evident at that

meeting that socialism in Germany was becoming the nucleus of a radical and democratic opposition to the government. Among the decisions of the congress was the recognition of the principle of protection for certain branches of industry. It also favored the Czar's disarmament plan, but urged that Russia should set the example by disarming herself.

Great Britain.—The Socialistic organizations in Great Britain are the Independent Labor Party, the Social Democratic Association and the Fabian Society. The Independent Labor Party is an organization of recent origin, having been formed at a meeting held at Bradford in 1893, where representatives from labor organizations and from the two Socialistic organizations above mentioned met and laid the foundation of a new party with distinctly Socialistic aims. As in Germany, their object is to socialize the means of production. They would have land treated as public property and capital owned and used collectively. As a means of bringing about an equitable distribution of wealth they favor a maximum eight-hour working day, and the guarantee of work to all capable adult applicants at a minimum rate of 6d per hour. (See *WAGES*, paragraph Living Wage Movement.) They do not stop short at this, but point out the methods by which the desired results may be obtained. These methods include the requirement that the parish, district, borough and county councils shall undertake industrial enterprise, and acquire land, plant and other necessary means of production, obtaining funds for their purchase by levying taxes upon rental values and borrowing money upon such levies as security. They furthermore demand old age pensions and state support for widows, orphans and disabled workers; the free support of children while at school; the increase of the age limit at which children may be employed; the recasting of the present system of taxation in such a way that the burden shall fall upon "unearned incomes," with a view to completely absorbing the latter; and finally among many minor changes, the assumption of all control over the liquor traffic by the people of each municipality. Among the general political aims of the party is the extension of the suffrage to both men and women. The Social Democratic federation appears to be a more radical organization and its members have opposed the Independent Labor party, but of late the two organizations have drawn together somewhat. See *FABIAN SOCIETY*.

France.—There are four groups of Socialists in France. In the first place there is the Workmen's party headed by M. Jules Guesde, whose members believe in the theories of Karl Marx. Its origin dates from the National Workmen's Congress at Marseilles in 1879. Its principles are akin to those of the Social Democrats in Germany, and recall the famous command of Karl Marx to "expropriate the expropriators," that is to say, they believe that the proletariat should secure possession of all political power and use it for the overthrow of the capitalistic system, after which capital should be employed for the benefit of society as a whole. They also uphold the spirit of the old "International" and favor an international agreement among workingmen. No national obligations are recognized by them, if they conflict with any of these aims. Its numbers are uncertain, but it claims 300,000 members and 450 associations. Secondly, there is the Possibilist party, which is an offshoot from the above, having separated from it in 1882. Thirdly, there is the Blanquist party, named after the famous revolutionary agitator Blanqui, and declaring itself to be "atheist, materialist, transformist, republicanist, revolutionist, communist and finally, internationalist." Its members distinguish themselves from the collectivist Workmen's party by the term communists. Fourthly, there is the Social Republican party, which is recruited from the ranks of the Radicals and has as its most prominent members M. Goblet and Millerand.

The idea of a general strike has been gaining ground among the French Socialists in recent years. Partial strikes seem to them to have accomplished practically little, and, as one of their writers says, a general strike is necessary to draw the attention of the militant members of the proletariat who desire to put an end to the capitalistic tyranny and to the tricks of politicians. A general strike would, it is thought, result in a sudden arrest of all branches of industry to the detriment of those in power and to the confusion of society. It would be the means of arraying the people against their oppressors. It would not, perhaps, be a revolt so much as a menace of revolt. The formation of the Syndicat Guérard is regarded as a step in that direction. This is a national organization of railway employees and its apparent end is the advancement of their interests, but it is said to be a revolutionary organization, working secretly to bring about an industrial revolution. Its organizer, M. Guérard, has been a strong advocate of a general strike and is reported to have said that such a strike would be the work of his Syndicat.

Austria.—Austria has a thoroughly organized Socialist party, which exerts a strong influence in the elections. It has made progress in Bohemia and Silesia. It is divided into two groups under the respective leadership of Dr. Adler and Herr Hauser. It has practical political aims as well as visionary ideals and it favors measures that look to the improvement of the condition of the working classes.

Spain.—Socialism is of more recent origin in Spain than in most of the other European countries, but within the past fifteen years it has made very rapid progress. After the dissolution of the "International" the movement was quietly but steadily progressive, the government having somewhat relaxed its severity. The socialistic body which is a factor in politics is the so-called Socialistic Labor party whose programme is practical as well as theoretical. Its chief aim is to gain possession of political power for the workingmen, and by this means establish the collective ownership of the means of production; but in the meanwhile it seeks to attain a number of immediate reforms in matters pertaining to individual rights and economic welfare. It desires the reorganization of society upon the basis of an economic federation, and claims that society should assume charge of the infirm and aged. The organization of the party was effected at the congress of Barcelona in 1888. It was there decided that its attitude towards the *bourgeoisie* should be one of unceasing hostility, and that in the matter of strikes it should always take the side of workingmen and workingmen's associations against employers. The next congress was held at Bilbao in 1890, and the numbers of the party had already shown a decided increase. The question of the party's attitude toward the elections was there discussed and it was decided that while the members should absent themselves *en masse* from municipal elections in which they could not hope for success, they should take an active part in the elections for the legislature. The third congress at Valencia in 1892 showed further growth on the part of the party. The fourth congress was held at Madrid, and the fifth at Valencia. At the latter, which was held in April, 1896, fifty groups were represented. It would seem from the discussions at these successive congresses that the party has changed its tactics somewhat and become less radical in its demands. Its majority consists of manual workers, and professional men are excluded, no matter how strong may be their sympathy with the working classes. The Socialist Labor party repudiates any anarchistic aims and deprecates all violent attacks upon persons or property. It was estimated that 5,000 votes were cast for Socialist Labor candidates in the legislative elections of 1891, 7,000 in 1893, and 14,000 in 1896. The leader of this party is Pablo Iglesias.

Other European Countries.—The extension of the suffrage in Belgium gave the Socialists a chance to make themselves felt in the elections of October, 1894, and the result was the return of 29 Socialist and Radical members. They appeared to be strongest among the Walloon element of the population. In the other countries of Europe there are parties with more or less Socialistic aims and they are often recruited from those who are for one reason or another discontented with their own party organizations. Such is the case in Denmark, where the kernel of the Socialist party is of the Marxist type, but where a more moderate group is classed with them. In Norway there is a party which desires the public ownership of land and of the means of production, but political aims are dominant in that country and Radicals and Socialists often vote together. In the Netherlands the Socialist Revolutionary party is very important. Switzerland also has a strong party of Socialists. See the separate articles on the European states (paragraphs Political Parties and History).

United States.—The strength of socialistic sentiment in the United States is hard to determine, for no single party organization includes all or even the great majority of those who have socialistic aims. At the same time there are signs that the doctrines are gaining ground and playing a more important part in practical politics. An illustration of this is the steady increase in the vote for candidates of the Socialist Labor party: In 1888, 2,065 such votes were cast; in 1890, 13,331; in 1892, 21,157; in 1894, 33,133; in 1896, 36,564; in 1897, 55,673; in 1898, 82,204. The platform of this party states that wages are steadily falling, as a result of the increasing competition which follows the constant displacement of labor by machinery; that the concentration of capital keeps pace with this decline in wages; and that the time has come for the collective ownership of the means of production. See also SOCIAL DEMOCRACY.

SOCIALIST TRADE AND LABOR ALLIANCE, organized in New York, in December, 1895, by trade unions seceding from the Knights of Labor and the American Federation of Labor. There are now 25,000 members.

SOCIAL SCIENCE ASSOCIATION, AMERICAN, founded in 1865, has 300 members. F. J. Kingsbury, President; Frederick S. Root, Secretary; and Arthur P. Stokes, Treasurer, 47 Cedar street, New York.

SOCIETE DES XX, founded in Paris in 1897, has bibliography for its object. Among its twenty members are Mme. Juliette Adam, Mme. Armande Carllavet, M. le Prince Roland Bonaparte, MM. Léon Bourgeois, Pierre Dange, and Georges Hugo.

SOCIETY FOR PLANT MORPHOLOGY AND PHYSIOLOGY. See BOTANY (paragraph Botanical Societies).

SOCIETY FOR PSYCHICAL RESEARCH. See PSYCHICAL RESEARCH.

SOCIETY FOR THE PRESERVATION OF VIRGINIA ANTIQUITIES, organized in 1887, consists of 500 members. President, Mrs. Joseph Bryan, Richmond; Secretary, Mrs. H. A. Claiborne, Richmond.

SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS, incorporated in 1866, is supported chiefly by bequests and voluntary contributions. It maintains a shelter for animals, ambulances, and has agents authorized to enforce the laws regarding sick, injured, or ill-used animals. President, John P. Haines; Vice-Presidents, Benjamin D. Hicks, Elbridge T. Gerry, Rev. Morgan Dix, Frederic Gallatin, W. C. Schemerhorn, Alfred Wagstaff, Morris K. Jesup, John Claflin, Parke Godwin, Charles Lanier; Secretary, George De Witt. Headquarters, Madison avenue and Twenty-sixth street, New York.

SOCIETY FOR THE PREVENTION OF CRUELTY TO CHILDREN, New York, founded in 1874, is the parent of all similar societies in the United States. It enforces all laws relating to children, receives on commitment all children charged with the commission of crime in New York, and all victims of physical violence. The Society, in 1898 received and investigated 8,283 complaints, and rescued 5,127 children from cruelty, vice, shame and suffering. It fed, clothed and sheltered 4,994 children, and with the assistance of the City Magistrates collected from parents for the support of children committed to institutions \$9,952, which was paid into the treasury of New York City. During the past 24 years the Society has received 121,054 complaints and rescued and cared for 78,849 children. President, Elbridge T. Gerry; Secretary and Superintendent, E. Fellows Jenkins. Office, Fourth avenue and Twenty-third street.

SOCIETY ISLANDS, a small archipelago in Oceanica known officially as the "French Establishments in Oceanica," having an area variously estimated at from 500 to 636 sq. m. with a population of from 12,000 to 16,000. The principal island is Tahiti, with a population of 10,113. The chief town is Papiet or Papeete, on the island of Tahiti. Among the exports are mother of pearl, copra, cotton, vanilla and oranges, and among the imports bread stuffs, canned provisions, wines, timber, sugar and calico, the imports being mainly derived from the United States, the British Empire and France and her colonies. It was reported in 1898 that the French government proposed to establish a line of steamers between Honolulu, Hawaii and Tahiti. Between San Francisco and Tahiti there has been regular communication by a line of sailing vessels subsidized by the General Council of the Society Islands for the transportation of the mails. The colony is not self-supporting. In the budget for 1898 the French government expended upon it the sum of 856,000 francs. The authority in Oceanica is vested in a Governor with a Council for consultation, and a General Council elected by universal suffrage.

SOCIETY OF AMERICAN ARTISTS, composed of 110 members, including painters and sculptors, exhibits every spring at 215 West Fifty-seventh street, New York. Two prizes are awarded annually. President, John La Farge; Secretary, Douglas Volk. See SCULPTURE (paragraph Exhibition).

SOCIETY OF COLONIAL WARS, organized in 1892, with membership of male descendants of men who fought under Colonial government from the settlement of Jamestown, Va. (1607), to the Battle of Lexington (1775), or who served in any official capacity under Great Britain's rule. It aims to "perpetuate the memory of these events and of the men who, in military, naval, and civil positions of high trust and responsibility, by their acts or counsel assisted in the establishment, defence, and preservation of the American Colonies, and were in truth the founders of this nation. With this end in view it seeks to collect and preserve manuscripts, rolls, and records; to provide suitable commemorations or memorials relating to the American Colonial period, and to inspire in its members the paternal and patriotic spirit of their forefathers, and in the community respect and reverence for those whose public services made our freedom and unity possible." The New York Society was the original one. Governor-General, Frederick J. de Peyster, New York; Secretary-General, Howard Pell, 40 Exchange Place, New York. The other societies are: New York, Pennsylvania, Maryland, Massachusetts, Connecticut, District of Columbia, New Jersey, Virginia, New Hampshire, Illinois, Missouri, Ohio, Nebraska, Minnesota, Kentucky, California, Colorado, Iowa, Georgia, Michigan, Wisconsin, Delaware and Rhode Island. Membership, 2,366.

SOCIETY OF MAYFLOWER DESCENDANTS, organized in New York in 1894, "to preserve their memory, their records, their history and all facts relating to them, their ancestors, and their posterity." The descendants of any passenger of the *Mayflower*, which arrived at Plymouth, December 1620, are eligible to membership. The annual meeting is Nov. 22, the date "The Compact" was signed. Societies are organized in New York, Massachusetts, Pennsylvania, and other States. Governor, Henry E. Howland, New York; Secretary, George E. Bowman, Boston.

SOCIETY OF MECHANICAL ENGINEERS, AMERICAN, founded in 1881, has now 1,950 members. The society holds two meetings a year. President, George W. Melville, Washington; Secretary, Prof. F. R. Hutton. Headquarters 12 W. 31st street, New York.

SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS, was organized in 1893 "to promote practical and scientific knowledge in the art of ship-building and marine engineering and the allied professions; and in furtherance of this object to hold meetings for social intercourse among its members, and the reading and discussion of professional papers, and to inculcate by means of publication the knowledge thus obtained." President, Clement A. Griscom, and Secretary and Treasurer, Francis T. Bowles, U. S. N. There is also a council of twenty-two officers and an executive committee. Membership, nearly 600.

SOCIETY OF NATURALISTS. See ZOÖLOGICAL SOCIETY.

SOCIETY OF OIL PAINTERS, called until 1898 the Institute of Painters in Oil Colours, was founded in 1883. The exhibitions are held in the headquarters in Piccadilly. President, Frank Walton; Vice-President, S. Milton Fisher; Secretary, W. T. Blackmore.

SOCIETY OF ST. VINCENT DE PAUL, a benevolent Roman Catholic Society, organized in 1835, incorporated in 1872, to relieve the poor in the large cities, to promote their education, procure employment for them, and distribute moral and religious books among them. The headquarters are in Paris. The Superior Council of the New York Circumscription is at 2 Lafayette Place. Of the local bodies, called Particular Councils, there are 62 in New York alone. Spiritual Director, the Rt. Rev. Bishop John M. Farley, V. G.; President, Jeremiah Fitzpatrick; Secretary, Thomas M. Mulry. The French Benevolent Society of the Ladies of St. Vincent de Paul, organized in 1845, cares for French widows, old and infirm women, and orphans, under the charge of the Sœurs Marianites de St. Croix. Mme. E. La Montague, President; Mlle. A. G. de Bloissières, Secretary, 44 W. 54th street, New York. Receipts for 1898 were \$7,786, expenditures, \$6,231.

SOCIETY OF THE ARMY OF SANTIAGO DE CUBA, was organized July 31, 1898, at the Governor's Palace, Santiago de Cuba. Its objects are to preserve the history and memories of the campaign which ended with the surrender of the Spanish army at Santiago de Cuba July 17, 1898. Officers, soldiers, and surgeons who served (about 18,000), are eligible. Officers: Major-General W. R. Shafter, President; Major-General Joseph Wheeler, Major-General J. Ford Kent, Major-General H. W. Lawton, and Major-General John C. Bates, Vice-Presidents; Major Alfred C. Sharpe, Secretary and Treasurer; Registrar-General, Major Philip Reade; Historian, Major Creighton Webb. All of these officers belong to the United States volunteers.

SOCIETY OF THE CINCINNATI, organized by the American and French officers at the cantonments of the Continental Army on the Hudson, in May, 1783. Its objects, as stated, were "to perpetuate as well the remembrance of this vast event as the mutual friendships which have been formed under the pressure of common danger, and, in many instances, cemented by the blood of the parties." It was then agreed that "the officers of the American army do hereby, in the most solemn manner, associate, constitute and combine themselves into one society of friends, to endure as long as they shall endure, or any of their eldest male posterity, and in failure thereof the collateral branches who may be judged worthy of becoming its supporters and members." Thirteen State societies were formed and one in Paris in 1784. The general society, composed of the general officers and five delegates from each State society, meets triennially. At its last meeting held in Philadelphia in May 1896, there were reported 527 members, including those of the newly re-admitted Virginia society. The next meeting will be held in New York in May 1899. President-General, Hon. William Wayne, Pa.; Vice-President-General, Hon. Winslow Warren, Mass.; Secretary-General, Hon. Asa Bird Gardiner, Rhode Island; and Assistant Secretary-General, Mr. Nicholas Fish, New York. The French society has lately been reorganized.

SOCIETY OF THE SONS OF WAR VETERANS, composed of male lineal descendants of those who served in the Union Army during the war of 1861-5, "to preserve and perpetuate the principles for which our ancestors fought in battle, to support, aid, and assist the Union soldiers and their widows, and for mutual benefit and advancement." Commander-in-Chief, J. J. Harvey, New York City.

SOCIOLOGY. During the year 1898 there has been a marked increase of the interest in sociological studies. An important event in the year's record was the annual meeting of the American Academy of Political and Social Science, whose opening session was held in Philadelphia on April 11, 1898. At the first annual meeting of this body in April, 1897, several topics were discussed, but in planning for subsequent meetings it was agreed that the discussion at these annual gatherings should be devoted exclusively to a certain topic. The topic chosen for the meeting of 1898 was the study and teaching of sociology. The discussion covered a wide range of topics and gave a very clear idea of the present condition of the science in regard to both its theoretical basis and its practical application. The discussion dealt with some

of the most primary elements in the study, even with the question of a suitable definition. This was natural enough since the definition and theoretical basis of the science are still matters of debate. To judge by the attitude of a large and influential portion of our daily press, we must conclude that there is no agreement in respect to the very fundamental question, What is sociology? According to the popular view sociology is not a science at all, but merely a descriptive term for a certain class of facts and ideas. This skeptical attitude results in part from the fear that sociological investigations may lead to discoveries which will endanger the present social order or injure vested rights, and in part from the feeling that a study which deals with such vast and complex matters can never present the exactness or the certainty of prevision which is essential to science. For both of these reasons there is a tendency to doubt the practical value of all attempts to form a theoretical ground work for sociology. The question of definition, therefore, is still debatable. In the opening address by Professor Franklin H. Giddings, who is regarded by many as the foremost representative of sociology in the United States, an attempt was made to find a satisfactory definition. Professor Giddings held that a sufficient definition of sociology is that it is a scientific description of society. He uses the term scientific description to include the explanation, prediction, and formulation of laws. It does not, he says, invalidate the claim of sociology to the name of science if it is shown that this description has not yet been extended to all the knowable facts of social life. It is sufficient to vindicate its scientific character if the scheme be wide enough and logical enough to assimilate these facts as they are discovered. It will be seen from this that Professor Giddings claims for sociology a definite scientific basis. He then goes on to discuss the important question whether it is justified in its claims by the practical results of its application. As this is the point at which skepticism enters in, it is worth while to give some account of his arguments.

Before it is possible to determine the practical value of sociology as affecting private conduct and public policy, it is necessary to answer first the question, What is society? "The most persistent, essential, and formative fact" of society he finds to be the existence of "like-mindedness." By this he means not only an agreement between individuals in respect to their thoughts and feelings, but a full consciousness of this agreement. In so far as there is like-mindedness among individuals, and therefore a tendency to work together for common ends, there is the phenomenon which we call society. The discovery of this principle he attributes to Paul, the most thoughtful of the apostles, who in casting about for some universal principle of social organization, found it in the fact of like-mindedness. He repeatedly urged his listeners to have no division among them, "to be of like mind," "to be of the same mind," "to be of one accord, having the same love." Even the wider social groups which seem rather to be physical than psychological unities, owe their social organization to this like-mindedness. Professor Giddings holds this fact to be the essence of the political system. Progress of society, of course, calls for recognition of new types of character and new ways of thinking, which are at variance with the prevailing like-mindedness. As these new factors are assimilated society changes for better or for worse. If for better, it does so by harmonizing these alien elements with the conditions already established, when the new elements are of the kind that make for improvement. At the same time in order for the progress to be continuous, there must be a constant rejection of those alien elements which are socially detrimental. In so far as dissent can be assimilated and exert a leavening influence it is a good thing. By this gradual process of assimilation society may in the course of time undergo a most radical change.

Another process of social change may come about through the voluntary and combined actions of great masses of men. Such, for instance, would be the American Revolution of 1776, the abolition of slavery, and the establishment of the French Republic. Sociology has a very practical value if it can make clear the injurious character of impulsive and unreasoning social action. By the study of the psychology of the mob, it shows that riots, insurrections, and revolutions, when they have nothing behind them, but mere passion, almost always start with acts of violence such as assault, thefts, and homicides and rarely with the striking of a well-directed blow by a disciplined force. In other words, there is rapid transition from the violent thought to the violent action. Sociology has fairly proved that mob action of this sort can not be restrained until it has run its course. It would, therefore, deprecate any influence that tends to lessen the control of reason, for if the habit of yielding to an emotional impulse be fostered in any department of life, it may show itself disastrously at those critical moments when masses of men are exposed to the temptation to commit on impulse some sudden subversive action. Professor Giddings holds that the only way to prevent this sort of epidemic madness which sweeps at times over the community, is to multiply the number of those men who habitually subordinate feeling to reason. In his application of this thought to religious matters, he was on somewhat dangerous ground and aroused opposition. He said that of all mistaken teachers in the community, the revivalist was most to be feared and declared that

throughout human history the revival meeting had been the foster mother of the mob because it was a powerful machine for encouraging men to give up the deliberating, critical habit, and to act on impulse. If a man acts in this way in regard to one class of things, he will, Professor Giddings thinks, be apt to act in the same way in regard to other things. "Let us not deceive ourselves," he says, "with the belief that we can make men irrational, impulsive, hypnotic creatures for the purposes of religion and then expect them to be cool-headed, critical, rational men for the purposes of politics." Some of his hearers objected to these statements and cited cases in which the revival meetings had rendered a community more law-abiding as well as improved its moral conditions in other respects. It was urged that even among the negroes of the south who attended revivals, there was little mob violence nor could it be said that the Salvation Army or the Methodist Church had tended to promote impulsive mob action of an injurious kind.

In the discussion of this point it was admitted by Professor Giddings that all progressive action did not necessarily follow from a balancing of pleasures and pains, but that on the contrary the greater part of progressive action proceeded from feeling. Still, he held that although the impulse may be the cause of action with the average man, he is apt to stop and think it over. It is only in cases where men forget to criticise, and act unreasoningly on impulse that the evils of mob action appear. How to control the impulsive action of the mob is one of the most important practical problems that sociology has to solve. It does not seek to check impulsive action altogether for it recognizes that progress takes place, in the main, as the result of this very thing, but it would advocate deliberation and criticism in order that it may be seen whither the impulsive action is tending. The case of the man of genius was brought up and became the subject of some interesting discussion. The man of genius, it was urged, acts upon impulse, and with him the deliberate and critical attitude seems not to prevail. Society cannot get on without the man of genius or the man of feeling for they are its motive forces to a high degree. Nevertheless the obligation remains to consider impulsive action under such leadership and to keep a sharp lookout on its destination. Society must know whether it is going right or wrong, and in order to do this it can not lay aside its critical watchfulness. One practical value of sociology is the emphasis which it lays on the fact that the traditional sanction or indeed any other sanction, is of no weight when compared with the standard of social utility. Whether an institution or a course of conduct is good or ill must be answered in every case by a reference to the test of its value as a means of social progress.

In a discussion of the theory of sociology many points to illustrate the progress of the science and the benefit that it had rendered the world, were brought out. It was shown that sociology had proved that the relations of men in groups can not be explained on the basis of the rationalism of Rousseau or the utilitarianism of Bentham. Sociology, by its close study of the individual, has demonstrated the great difference between the action of individual man and action of social groups. Political science, it was said, fails because it deals not with man as he is but with a sort of ideal man. In projects for political reform the appeal to the highest self-interest of the individual often fails because he is unable to weigh with fairness the ultimate good as against an immediate gain. That social instincts and sentiments, quite apart from this higher self-interest, move the social group in its strivings toward political ideals, was argued by Professor L. S. Rowe in an interesting paper on *Sociology and Politics*, read before the Academy.

In a paper on *Sociology and Philanthropy*, read before the Academy by Frederick Howard Wines, the writer emphasizes the close interdependence of the two subjects—interdependence, which he thinks it as absurd to ignore as the interdependence between theory and practice in medicine. He points out that the philanthropist should be a sort of sociological practitioner, knowing the principles on which he acts as well as the medical practitioner understands the principles of his science. The science and the art, that is, the practice of the science, go together, for if the art is founded upon the science it is not less true that the science obtains its material very largely from the practice of the art. Yet of sociology itself he says, that he has discarded for himself many of the ideas which influence scholars to a very high degree. For instance, the biological analogy according to which arguments are based on the likeness between the life of a society and the life of an animal or plant no longer appeals to him for it remains to him merely an analogy, and not by any means an identity. Arguments based on the value of society as an organism are too apt, he thinks, to confound metaphor with fact. The subject matter of sociological study is more complex than that of any other subject of scientific investigation, since it concerns itself with man, in whom there is such a mingling of tangible with intangible things that the exact methods of the chemical laboratory are impossible. He deprecates also the attaching of so much importance to the speculation in regard to the origins of social and individual life in a remote, inaccessible past. This study

of origin has characterized the work of many of the most eminent sociologists of to-day. But it is criticised by the writer as fruitless on the ground that it deals with matters which can not be ascertained by observation or historical records or tradition, and exaggerates the correspondences between that which is savage and that which is primitive. The main sources of sociological knowledge, he thinks, are history and law, since in them, if anywhere, the law of social evolution can be discovered.

As an answer to the question what can the sociologist do for the philanthropist, he says, that without scientific knowledge in regard to the structure of society, the philanthropist is no better than a social quack. His intentions may be of the best, but his labor will be misdirected and productive of more harm than good unless he trains himself in the art of deduction and generalization, or has by his side an expert sociologist to point out to him the wider bearings of his proposed measures of reform. The ignorance of charity workers and its bad results are cited in proof of the need of a better scientific training for men and women who attempt to redress the evils of society. He would have the teachers of sociology seek their pupils among this class rather than in the college or university. The charity conference is the place, he thinks, for fruitful results to follow sociological teaching. The charity worker should be instructed in the right methods of research, and since his aim is disinterested and his desire for knowledge sincere, this instruction would be certain to have good effects.

On the other hand the sociologist needs no less the aid of the philanthropist, for the experience of the philanthropist in practical affairs is just what supplies data to the scientific student. The actual affairs of man are, in fact, the sociological laboratory, and just as the political economists must associate with business men and financiers, so the sociologist should cultivate those men who practice the art of relieving social distress. To be sure, the sphere of the philanthropist's activity is narrow, but within its limits his observation may be accurate and its results trustworthy. It is certainly foolish to divorce theory from practice, since neither can subsist without the other; so the author renews his appeal for an intimate association between professional sociologists and professional philanthropists.

A practical instance of the value of a sociological training for those whose profession it is to alleviate social distress was afforded in a paper read by Miss Mary E. Richmond, Secretary of the Charity Organization Society of Baltimore, on the *Training of Philanthropic Workers*. The paid workers in the Charity Organization Society, she said, received no training whatever, although the department of work in which they were engaged has become highly specialized. The need of some training for these people was becoming more and more urgent and some societies, recognizing this fact, maintain a sort of training school for their own agents. Something more than a knowledge of details is necessary for the success of the charity worker. He or she should have a general outlook of the whole field, and this can result only from a systematic training. The low salaries paid by the Charity Organization Society are not sufficient to induce young men of ability to undertake the work, nor does the young man just graduated from college often show himself fit for the task. His lack of experience in practical affairs impairs his usefulness. The writer suggests as a way out of the difficulty, the establishment of a training school for paid charity workers. The school should give its pupils practical experience in charity work, at the same time that it taught them the general principles of scientific philanthropy. Even the most intelligent applicants for paid charity work often failed at first on account of their want of experience. The need of an adequate course of training, she thought, was very great.

In the discussion of this paper the defects of the present system of charity work were brought out. It was suggested that there must be special training for the voluntary as well as the paid workers. Miss Richmond's proposal of a special school was favored and it was also suggested that more training in work of this nature might be afforded in connection with the universities. It was generally considered that the university courses gave too little attention to practical sociology, and that such courses as were given in sociology were not likely to be of any use to the practical charity worker. It was suggested that courses should be arranged by the colleges and universities, which could be thrown open to outsiders who wished to study such sociological topics as would bear upon their work. An extension of the plan adopted by the Charity Organization Society of New York City was also recommended. This society takes a certain number of persons into its office in the summer months and gives them work to do in which they have the benefit of access to the records and of general supervision. The connection between the university and the Charity Organization Society, which had already been tried with success, seemed to promise a partial solution of the problem. The university settlement and the university extension movement had also done much to bring greater intelligence to bear on charitable work and a great deal was hoped of them in the future.

In the discussion of the teaching of sociology and the social sciences, a good deal was said about the deficiency of the average school and college curriculum in respect to these subjects. It was held that there was no reason for the exclusion of social sciences from the high school. Political economy and allied sciences seemed to have as much right in the high school curriculum as history. As to colleges it was urged that the man who passed from college into active life certainly needed a training in the principles of social sciences. And contrary to the prevailing practice, these studies should come early in the course, if possible, in the first two years. It was held that what is sometimes called descriptive sociology might be pursued with advantage during the early half of the course, since it would serve as a good preparation for the more advanced work in political economy and social science proper. Sociology, in the narrow sense, however, that is in its theoretical aspect, should come late since the student needs first a knowledge of statistics and comparative institutions. In general, the plea was made for greater attention and better instruction on social questions in school and college. It was complained that while in the more advanced department of the subject there was no lack of good text books, the elementary field was very imperfectly covered. There seemed to be a need of more elementary works which should serve as an introduction to the study of sociology proper. The growing interest in the science was undeniable, and from all sources came inquiries from would-be students who were anxious to know where to begin. Practical and elementary instruction and clearly written introductory works were regarded as the need of the time.

SOLAR PARALLAX. See ASTRONOMICAL PROGRESS.

SOMALI COAST PROTECTORATE, a British dependency extending along the south coast of the Gulf of Aden from the French territory of Obock to Italian Somaliland. It has an area of about 68,000 square miles with a population whose numbers have not been determined. The chief town is Berbera, with 30,000 inhabitants; and other important ports are Zeila and Bulhar. The natives are mainly Mohammedan, and nomadic in their habits. The chief products and exports are skins, hides, ostrich feathers, cattle, sheep, and gum, and the trade is considerable. The administration is in the hands of a British Political Agent and Consul, under the general direction of the Bombay government. Politically, therefore, it belongs to the Asiatic and not to the African possessions of Great Britain. It has been a British protectorate since 1884. In 1894 the boundary line between it and the Italian possessions was fixed. In 1897 by an agreement with Abyssinia the limits were reduced from 75,000 to 68,000 square miles.

SOMALILAND, an Italian dependency on the Somali coast of the Indian ocean, extending from the Gulf of Aden to the Juba river. It is cut off from the interior by British East Africa, Abyssinia, and British Somaliland. It has an area of about 100,000 square miles and a population estimated at 400,000. The Italian possession of this territory dates from 1889 when the native sultans accepted an Italian protectorate over their territories. This protectorate was extended in 1892 by an agreement with the sultan of Zanzibar. By agreements in 1891 and 1894 the respective boundaries of the Italian and British possessions were determined. The treaty of Adis Abeba in 1896 fixed the limits of the Italian Somaliland, which was thenceforth to include the strip of territory extending along the coast and for about 180 miles into the interior.

SONS OF THE AMERICAN REVOLUTION, organized in New York in 1889 and chartered in Connecticut in 1890. There are 32 State societies, one in the District of Columbia, and one in Hawaii. The last meeting of the general society was held in Morristown, N. J., in 1898, when the total membership was reported as 9,141. The next meeting will take place in Detroit in April, 1899. The aims are the same as those of the Sons of the Revolution (q. v.), which is the older society. President-General, Edward S. Barrett; Secretary-General, Samuel E. Gross, Chicago.

SONS OF THE REVOLUTION originated in New York in 1875 with John Austin Stevens, was organized in 1876, re-organized in 1883, and incorporated in 1884. There are about 6,000 members, descendants from an ancestor who either as military, naval, marine officer, soldier, sailor or official in any of the original thirteen States, aided the cause of American independence. The objects are to "keep alive among ourselves and our descendants the patriotic spirit of the men who, in military, naval, or civil service, by their acts or counsel, achieved American independence; to collect and secure for preservation the manuscript rolls, records, and other documents relating to the War of the Revolution, and to promote intercourse and good feeling among its members now and hereafter." The last triennial meeting took place in Savannah, Ga., in 1896, the next will be held in New York, in April, 1899. There are 30 State societies and one in the District of Columbia. General-President, ex-Gov. John Lee Carroll, Maryland; General-Treasurer, R. M. Cadwall-

der, Pennsylvania; General-Secretary, J. M. Montgomery, New York, and General Historian, Gillard Hunt, District of Columbia.

SONS OF VETERANS, U. S. A. The first camp of this society was organized in Philadelphia, Sept. 20, 1879. The members, now about 100,000, are lineal descendants of soldiers, sailors and marines, who fought in the Union army in 1861-65. There are now about 2,000 camps, each with its own officers, headed by the captain and twenty-nine divisions, at the head of each of which is the commander. Commander-in-Chief, Frank L. Shepard, Chicago. The 18th annual encampment will be held in Detroit, in September, 1899.

SOROSIS, founded in New York in 1868, the first of all women's clubs in the United States. It is both political and literary, and the parent of the Woman's Club movement. President, Mrs. Dimies T. S. Denison; Secretaries, Mrs. Miriam Mason Greeley and Mrs. Evelyn Aull Stump.

SOUDAN. See EGYPT.

SOUTH AMERICA. The statistics and recent history of the countries of South America are given in the separate articles on those countries. The present article is concerned only with the development of the foreign trade of South America. For years a great deal has been said about the desirability of obtaining for the United States its due share of the markets of South America, and much has also been said of the progress and enterprise of German merchants in developing valuable trade connections in that Continent. Some important facts relating to these subjects are given in the United States Consular Reports for 1898. In the first place it is pointed out, that while in general German trade has greatly increased in the last few years, it has shown a tendency to fall off or to remain stationary in South America. At all events the progress of its export trade to the South American Republics seems to be very slow. It is said that although Germany sent to those markets commodities to the value of \$41,000,000 in 1888, the German exports amounted to only \$41,500,000 in 1896. Not so the import trade, which during the same interval increased from \$63,500,000 to \$79,700,000. The chief articles of export from Germany seem to have been the products of textile and iron industries, including woven cotton cloth, hosiery, worsted, and coarse iron ware. In the exportation of those articles to the Argentine Republic there was a falling off in each; in the case of cotton cloth the falling off was more than 50 per cent. and in the case of coarse iron ware of nearly 35 per cent. The exportation of these articles to Brazil and Chile also decreased, and these three States contain the most important markets for German goods.

It was not only in these staple articles that the German export trade decreased, but in a large number of other articles. A similar decrease in 1897 appears also in Germany's trade with Colombia, Peru, Uruguay and Venezuela, but it should be noted that the decrease is reckoned in the quantity of goods, not in the value of the trade, for it was said in another Consular Report that these four states took from Germany in 1897 goods worth \$7,600,000, against \$7,100,000 in 1896. The Germans are making efforts to promote business interests with South American states and place them on a firm basis. In some quarters it is even urged by the Germans that the United States should be induced to bring all South and Central America under its influence on the ground that this would greatly benefit the trade conditions.

The exports of cotton cloth, hosiery and coarse iron ware to Ecuador increased, but German trade with that country was too insignificant to offset the losses elsewhere. The general conclusion to be drawn from the statistics is that the export trade as a whole has considerably declined. The causes of this decrease are disputed, some attributing it to the unstable condition of South America and others to the lack of commercial treaties between Germany and South American countries.

Notwithstanding the recent decline, which our Consular Reports allege to have taken place in the German export trade with South America, it is generally admitted that the industrial and mercantile enterprises of the Germans on that Continent have been enormously extended. German banks have been established in Rio de Janeiro, Buenos Ayres, Valparaiso and other places, and Germany has extensive interests in mines in Brazil, Chile and Peru and in railroads in Venezuela, besides large amounts of capital invested in Mexico, Guatemala and other Central and South American States. A large number of industrial enterprises of various kinds, including breweries, hat and shoe factories, paper mills, soap and candle factories, etc., have been established. In a single Consular district in Venezuela it was reported that the German trade amounted to many millions of dollars and the same was said to be true of the other districts. Our Consuls have repeatedly pointed out the methods which the Germans have employed in building up this valuable business and suggested many ways in which the Americans might profit by their example. The lack of success on the part of Americans is attributed largely to the fact that they rely on trade catalogues and do not send representatives to South American countries to familiarize themselves with conditions there and adapt our trade to the local needs.

It is thought that only by actual residence and a knowledge of the language and the customs of the people, American trade can compete successfully with its German rival. During the year ending June 30, 1898, the exports from the United States to South America were \$33,821,701 and the imports from South America to the United States were \$92,091,694.

SOUTH AMERICA, BOTANY OF. See BOTANY.

SOUTH AUSTRALIA. A colony including the centre of the Australian Continent, with an area of 903,690 sq. m., and a population on December 31, 1896, of 355,286. It will thus be seen that the country is very sparsely populated. There is, in fact, only about one person to three square miles. The capital is Adelaide with a population (including suburbs) of about 144,352. Agriculture and stock-raising are the main occupations, but the mineral resources are said to be important though not yet developed. There is much excellent pasturage, and in the south wheat is produced in great quantities. Of live-stock sheep are the most important. The mineral wealth, so far developed, consists of copper and silver, but gold and lead are said to occur. By far the largest share of the foreign trade falls to the United Kingdom, the Australian colonies and other British possessions. Wool is the staple article of export. The imports for 1897-98 were £6,444,238 and the exports £6,513,347. The revenue, derived mainly from customs duties, inland revenue, territorial receipts, posts, telegraphs and railways, was in 1898, £2,648,899, and the expenditure was £2,619,220. The public debt in 1898 was £24,408,535. One-half of this was represented by the railways.

On June 4, the question of federation was submitted to popular vote and the returns gave 25,659 votes for the measure and 15,121 against it.

SOUTH CAROLINA, a southern Atlantic State, has an area of 30,570 sq. m. Capital, Columbia.

Mineralogy.—The principal economic production is phosphate rock, which in 1897 yielded a total of 358,280 long tons, worth \$986,572. This was the smallest output of any year since 1885, and comprised 267,380 tons of land rock and 90,900 tons of river rock, the former being worth \$748,050. Gold mining yielded 4,097 fine ounces, worth \$84,959, or \$21,400 more than the product of 1896, and silver had a reduced output of 200 fine ounces. In quarrying, granite yielded \$37,820, a decline from 1896 and an increase over 1895; and limestone \$30,000, the highest since 1892. The clay-working industry, with 56 plants, had an output worth \$291,197, all excepting \$700 being brick and tile.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 17,519,070 bushels, value \$8,058,772; wheat, 1,181,709, \$1,110,800; oats, 4,208,118, \$1,893,653; rye, 33,516, \$34,186; potatoes, 266,500, \$266,500; and hay, 238,110 tons, \$2,262,045—total value, \$13,625,956. The cotton crop in the season of 1897-8 was 1,030,085 bales, valued at \$28,732,899, of which 1,019,843 bales were upland cotton and 10,242 bales sea-island; total acreage, 2,074,778. There was a notable increase both in acreage and production. Live-stock comprised, horses, 66,979; mules, 97,357; milch cows, 126,762; other cattle, 141,509; sheep, 66,540; and swine, 1,041,462—total head, 1,540,609.

Industries.—Owing to numerous protests against the leasing of convicts to contractors, the State purchased three plantations and set the inmates of the penitentiary at work growing cotton; as rapidly as leases expired the convicts were sent to the plantations, where they seemed far more contented than when otherwise employed. The first year of this experiment yielded the State a profit of \$58,000. In 1898 the cotton mills numbered 76, had an aggregate of 1,307,566 spindles, and bought 398,456 bales of cotton for their work. The taxable manufactures of the State yielded the Federal government \$131,293 in internal revenue in the year ending June 30, 1898.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise at the ports of Beaufort, Charleston and Georgetown, aggregated in value \$1,378,294; exports, \$13,867,238, an increase in imports and a decrease in exports.

Transportation.—The total steam railroad mileage of the State on January 1, 1898, was reported at 2,666.07, of which 12.01 were constructed during the previous year. The assessed valuation of all railroad property for 1897 was \$24,142,341, the highest figure ever reached. Street railroads, electric and horse, have a total length of about 50 miles, principally in Charleston and Columbia.

Banks.—On October 31, 1898, there were 16 national banks in operation and 6 in liquidation. The active capital aggregated \$1,943,000; circulation, \$691,457; deposits, \$4,306,233; reserve, \$873,220. State banks June 30, 1898, numbered 23, and had capital, \$1,142,947; deposits, \$1,646,445; resources, \$3,662,098; surplus, \$105,551; and stock savings banks, 4, with capital, \$134,600; deposits, \$2,214,508; resources, \$2,584,861.

Education.—At the end of the school year 1896-7 the school population was esti-

mated at 473,200, of whom 258,183 were enrolled in the public schools, and 182,559 were in daily attendance. The percentages of enrollment by races were, white, 69.42; colored, 71.81. There were 4,189 school houses; 4,973 teachers; public school property valued at \$845,596; and expenditures, \$697,068, including \$599,180. For higher education there were 67 public high schools; 32 private secondary schools, 2 public and 6 private normal schools; 9 colleges and universities, co-educational and for men only, with 78 professors and instructors, 1,415 students, and \$100,150 income; 2 technical institutions; 8 colleges for women, with 103 instructors, 1,217 students, and \$88,700 income; and a law, a medical, and 3 theological schools. In 1898 the Clemson Textile School, the first institution of the kind in the South, was opened as a Department of Clemson College. It occupies a building of its own, resembling a modern cotton mill, and its four years' course comprises two years of study of general technical principles and two of practical application. In proportion to her total wealth, South Carolina now pays a larger school tax than any other State in the Union, and her educational interests are showing a pleasing advance. The periodicals of all kinds numbered 125 in 1898.

Finances.—The treasury receipts of the calendar year 1897 were \$1,253,076, making with the balance from 1896, \$2,633,497; disbursements, \$2,194,079, leaving balance \$439,418. The total recognized debt January 1, 1898, was \$6,850,507, of which \$6,499,799 was funded. Assessed valuations for 1897 were the highest on record; real estate, \$102,088,325; personal property, \$47,641,516; railroad property, \$24,142,341; total, \$173,872,182; tax rate, \$5 per \$1,000. In his message to the Legislature in January 1898 the Governor stated that the deficit in the State treasury was due to dispensary mismanagement.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 1,320,000. Local estimates gave Charleston 65,165; Spartanburg, 10,000; Newberry, 4,870.

Legislation.—The State legislation of the year was not important. An attempt was made to equalize the charges of telephone companies. The act prohibited any telephone company doing business in South Carolina from making any difference in the rates at which it furnishes telephones and telephone service to patrons or subscribers at its different offices or places of business in the several cities or towns more than is necessary on account of the difference of cost of supplying such telephones and telephone service, the number of its subscribers at its different offices or places of business being taken into consideration. Any company charging a higher rate in violation of these provisions is to pay to the patron double the difference between the rate so unlawfully charged and that which should be charged, to be recovered by suit in any court of competent jurisdiction.

Express and telegraph companies are also placed under the supervision of the Railroad Commissioners, who have power to regulate transportation and message transmission charges. Telephone companies, palace-car, sleeping-car, drawing-room-car, dining-car, express and fast freight, and joint-stock associations, companies, co-partnerships, and corporations doing business in the State are taxed; and another act provided for winding up the business of corporations whose charters expire or are annulled, or otherwise dissolved, and for the appointment of receivers for them.

Another law was directed against trusts. It forbids "all arrangements, contracts, agreements, trusts, or combinations between two or more persons, individuals, firms, or corporations, made with a view to lessen, or tend to lessen, full and free competition in the importation or sales of articles imported into South Carolina, or in the manufacture or sale of articles of domestic growth or of domestic raw material; and arrangements, contracts, agreements, trusts, or combinations between persons or corporations which are designed or which tend to advance, reduce, or control the price or cost to the producer or consumer of any such product or article, and all arrangements, contracts, trusts, syndicates, associations, or combinations that may lessen or affect in any manner the full and free competition in any tariff, rates, tolls, or premiums, or which may seek to control the same in any branch of trade, business, or commerce." Following the example of Georgia, Alabama, Tennessee, Louisiana and Florida, South Carolina passed a "Jim Crow" car bill forbidding negroes to ride in the same car with whites.

Elections.—In the State and Congressional elections, Governor Ellerbe was re-elected, as were six out of the seven Congressional representatives. All elected were Democrats. The election generally was dull, but in some towns, especially in Greenwood county, was attended with riots on the part of the whites against the negroes.

Race Troubles.—The excuses offered as being in some measure an extenuation of the North Carolina riots can not be made to apply to the troubles in South Carolina. Here the white population had suffered little from negro official arrogance and there was no danger of "negro domination." Bitterness against the blacks, however, seemed quite as strong as in the northern State. The trouble was chiefly in Greenwood

county and began at Phoenix on election day over the examination of negro election certificates. In this district R. R. Tolbert, chairman of the Republican State committee, was a candidate for Congress. In the Phoenix precinct Thomas Tolbert, who was taking affidavits of negroes who were not allowed to vote for his brother, was attacked by one Etheridge, the Democratic manager at another precinct. A riot ensued, two or three hundred negroes opened a fusillade on the store in which the voting was going on, and Etheridge was killed and Tolbert mortally wounded. The latter's father, John R. Tolbert, collector of the port of Charleston, who had come to the precinct to vote, attempted a rescue together with his nephew, but both were fired upon and dangerously wounded. They retreated to Columbia, where they were sheltered in the penitentiary. The Democrats then made an effort to drive out of the district all the remaining men of the Tolbert family, who, they alleged, had incited the negroes. Among the others was J. W. Tolbert, assistant postmaster at McCormick, who was forced to leave the State. A party of Democrats who were trying to find the slayer of Etheridge was fired upon from ambush by negroes; scouting parties then set out and killed ten negroes, four of them being lynched on suspicion. The Tolberts appealed to the Federal government, and, since J. W. Tolbert was a Federal official, the Attorney-General instructed the South Carolina Marshall and District Attorney to investigate and report. Other shooting affrays, lynchings, and acts of violence, not mentioned above, took place, and it was said that more than thirty persons were killed and a fairly large number wounded in the Carolinas during the first half of November. Some blame was attached to the executive authorities of both States; and, in regard to South Carolina, the *Charleston News and Courier* went so far as to say, "the lawfully constituted authorities of the State are indifferent or imbecile, or both, in the discharge of their duty."

The strained conditions existing between the whites and the negroes became evident earlier in the year, when on February 22 a mob of about 200 white citizens of Lake City, Williamsburg county, made an attack on F. B. Baker. The latter was a negro who, to the great indignation of the whites, had been appointed postmaster of the town. The South Carolina delegation in Congress had endeavored to have him removed, but without success; and previous to the attack above mentioned two attempts at assassination had been made upon him. At about one o'clock on the morning of the 22d the mob set fire to the building which served as Baker's living house and the post-office. As the inmates came out, a volley was fired, killing Baker and his infant child, and wounding several other children and the mother. Governor Ellerbe offered a reward of \$500 for the information leading to the arrest of the murderers, and the Federal authorities also started an investigation of the affair, offering a reward on Mar. 4 for the conviction of the guilty persons. The bitter feeling against the negroes had apparently increased during the last few years, owing in part to the practice of bestowing Federal offices upon negroes in spite of the repeated protests of the whites.

National Representatives and State Officers.—South Carolina's Representatives are: William Elliott, from Beaufort; W. J. Talbert, from Clarksville; A. C. Latimer, from Belton; Stanyarne Wilson, from Spartanburg; D. E. Fenley, from Yorkville; James Norton, from Mullins; J. W. Stokes, from Orangeburg. All are Democrats. Senators: Benjamin R. Tillman (Dem.), from Trenton, and John L. McLaurin (Dem.), from Bennettsville. The State officials are: Governor, W. H. Ellerbe; Lieutenant-Governor, M. B. McSweeney; Secretary of State, M. R. Cooper; Treasurer, W. H. Timmerman; Comptroller, D. P. Derhenen; Attorney-General, G. D. Billinger; Adjutant-General, J. W. Floyd; Superintendent of Education, J. J. McMahon. Chief Justice, Henry McIver; Associates, Eugene B. Gary, Ira B. Jones, Y. J. Pope, and U. R. Brooks. All the State officials and all the members of both Senate and House, with one exception, are Democrats.

SOUTH DAKOTA, a north-western State of the American Union, has an area of 77,650 sq. m. Capital, Pierre.

Mineralogy.—As estimated by the Director of the Mint the value of the output of gold was \$4,969,800 in 1896; \$5,694,900 in 1897; and \$5,841,406 in 1898. Silver yielded \$296,727 in 1896, and \$190,836 in 1897; and fresh discoveries of copper brought the production of that metal up to 2,440,338 pounds in 1897. During that year more mines were opened and more new mining country exploited than in any three years previous in the history of the Black Hills. Other economic productions were: granite, \$68,961 (\$199,977 in 1896), largely used for paving; gypsum, \$19,240; and clay, \$21,800, wholly in brick and tile. See ARTESIAN WELLS.

Agriculture.—The year 1898 was very favorable to the agricultural interests of the State and the farmers and stockraisers enjoyed great prosperity. The following shows the production and value of the principal crops in the calendar year 1898: corn, 28,109,956 bushels, value \$6,465,290; wheat, 42,040,923, \$21,020,462; oats, 16,126,578. \$3-

386,581; barley, 2,484,897, \$670,922; rye, 48,439, \$16,469; potatoes, 3,979,224, \$1,114,183; and hay, 2,655,733 tons, \$7,967,199—total value, \$40,641,106. The State ranked fifth in the production of wheat. Live-stock comprised horses, 290,746; mules, 6,693; milch cows, 372,321; other cattle, 449,362; sheep, 363,697; and swine, 145,469—total head, 1,628,288.

Manufactures.—In 1898 it was estimated that excluding agriculture and stock-raising there were 5,435 persons engaged in industrial pursuits in the Black Hills region, who were receiving annual wages of about \$6,500,000. In Custer county 13 sawmills and in Pennington county 12, had a combined output of lumber aggregating 123,020,000 cubic feet, valued at \$1,854,850. Quarrying was believed to have yielded \$300,000; brick-making, \$100,000; and lime and stucco, \$25,000.

Banks.—On October 31, 1898, there were 26 national banks in operation and 27 in liquidation. The active capital aggregated \$1,585,000; circulation, \$519,890; deposits, \$4,338,245; reserve, \$1,348,282; resources, \$7,398,366. The State and private banks combined, June 28, 1898, numbered 164, and had capital, \$2,077,980; deposits, \$5,467,860; resources, \$8,440,641; surplus, \$234,318. In the year ending September 30, 1898, the exchanges at the United States clearing house at Sioux Falls aggregated \$5,748,278, an increase of \$2,857,631 in a year.

Railroads.—The railroad mileage of the State has remained nearly stationary in the last four years, with a total of about 2,800.

Education.—The last report available at the time of writing was for the school year 1895-6, and showed school population, 106,497; enrollment in public schools, 89,001; attendance, 54,600; school houses, 3,739; teachers, 4,508; school property valued at \$2,929,744; and expenditures, \$1,280,663, including \$829,083 for teachers' salaries. For higher education there were 29 public high schools; 7 private secondary schools; a private and 2 public normal schools; 5 colleges and universities, with 60 professors and instructors, 696 students, and \$44,177 income; and 2 technical schools, the State School of Mines and the State Agricultural College. The last, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the last year there were 261 periodicals, including 20 dailies and 223 weeklies.

Finances.—The assessed valuations in 1898 as equalized aggregated \$118,580,491, the lowest figure ever reached; tax rate, \$3 per \$1,000. The total bonded debt July 1, 1898, was \$861,600, against which were sinking and other available funds, \$141,283, making the net debt \$720,317.

Population.—State census of 1895, 330,975; Federal estimate, June 30, 1898, about 395,000. Local estimates gave Yankton, 4,500; Deadwood, 4,200; Aberdeen, 3,500.

Constitutional Amendments.—South Dakota was admitted into the Union in November, 1889, and has almost invariably submitted every question to the direct popular vote. In 1890 female suffrage was defeated by 45,682 votes, against 22,972. In 1898 the question was again voted on with the result that there were 19,689 in its favor and 22,983 against it. The figures seem to show languid interest on both sides. Though the proposed amendment was defeated the following were adopted. The constitution, adopted 1889, contained a prohibition clause. In 1898 an amendment was adopted doing away with this by 22,170 votes to 20,557. It was provided that the State should carry on the exclusive manufacture and sale of intoxicating liquors. This amendment was ratified at the November elections.

South Dakota introduced the initiative and optional referendum by a constitutional amendment adopted by the people November 8, 1898, providing that when five per cent. of the qualified voters of the State demand it, any proposition must be submitted by the legislature to the people at the next general election. If then approved, it becomes law. A law already passed, moreover, may again be submitted on the demand of five per cent. of the electorate, in the same way. If approved, it stands; if not, it fails to be law. This is the first general application of the principle in any State and its operation will be watched with great interest. As in the case of the vote for female suffrage, there was no general interest in the question, since, of the 74,000 who voted for governor, only about 40,000 voted for or against the referendum.

Politics and Elections.—In the Congressional elections the contest was between the Republicans on the one hand and the fused Democrats, Silverites, and Populists on the other. The Republican convention renewed its allegiance to the fundamental principles of Republicanism, protection and sound money. It declared itself opposed to the free and unlimited coinage of silver and indorsed the gold standard under which the nation had made such progress. It also approved the administration's course on the Annexation question. A very close contest resulted in the election of the Fusionist candidate for Governor, Andrew E. Lee, by a plurality of only 370 votes. The Republicans, however, elected their Representatives to Congress.

National Representatives and State Officers.—South Dakota's Representatives are: Robert J. Gamble (Rep.), from Yankton, and Charles H. Burke (Rep.), from Pierre. Senators: Richard F. Pettigrew (Rep.), from Sioux Falls, and James H.

Kyle (Independent), from Aberdeen. Officials (1899), Andrew E. Lee (Pop), Governor; John T. Kean (Rep.), Lieutenant-Governor; W. H. Roddle (Rep.), Secretary; John Schamber (Rep.), Treasurer; James D. Reeves (Rep.), Auditor; John T. Pyle (Rep.), Attorney-General; E. E. Collins (Rep.), Superintendent of Education; Chief Justice, Dighton Corson; Justices, Dick Haney and H. G. Fuller; Clerk, Miss Jessie Fuller. All are Republicans. The State legislature consists of 87 Republicans and 45 Democrats.

SPAIN occupies the greater part of the peninsula which forms the southwestern corner of Europe and has an area including the Canaries and the Balearic isles, of 197,670 square miles, with a population according to the census of 1887 of 17,565,632. Capital, Madrid, with a population in 1887 of 470,283. The natural resources of the country are extensive. It is estimated that about four-fifths of the soil is productive, and of this about one-third is devoted to the raising of agricultural products, the chief crops being wheat, rice, maize, barley, and other cereals. Fruits are raised in abundance, including oranges, raisins, grapes, nuts and olives. Wine is produced on an extensive scale and is an important article of export. The religion of Spain is Roman Catholic and only a very small fraction of the population are Protestants. Education is compulsory, but is inefficiently managed. It was estimated that in 1889 68.1 per cent. of the population could neither read nor write.

Commerce.—It was reported by the United States Consul at Malaga, under date of February 10, 1898, that the commerce of Spain for 1897 was as follows: imports, \$153,114,836; exports, \$179,512,657, in each case a considerable advance over the previous year. In the case of the exports almost all the articles showed an increase; in the case of imports the increase was chiefly in mineral products; chemical products; cotton, and cotton manufactures; paper and paper manufactures; vegetable fibre, and its manufactures; wool, and woollen manufactures, animals, and machinery. The customs did not yield as large an amount as in 1896, owing, it is said, to the falling off in the imports of wheat. There is a tariff upon wheat and wheat flour, but a temporary reduction was made in duties on March 5, 1898. Spanish commerce suffered heavy losses during the war of 1898, but trustworthy statistics showing the extent of the damage are not available. It was reported, however, that during the month of June, 1898, the imports fell off \$9,843,000, as compared with the same month of the previous year. After the war it was reported that notwithstanding the disasters which Spain had passed through the country offered an excellent field for foreign capital. It was said that French capital had already taken advantage of the industrial openings, and that there was a good chance for the introduction of the products of American industry.

Army and Navy.—The Spanish army consists of the permanent army, the first or active reserve, and the second or sedentary reserve. The permanent army comprises eight army corps with headquarters respectively at Madrid, Seville, Valencia, Barcelona, Saragossa, Burgos, Valladolid and Corunna. It is constituted as follows: Infantry, fifty-six regiments; Chasseurs, five brigades; Cavalry, twenty-eight regiments; Artillery, five regiments of field, or mountain artillery and five battalions of fortress artillery; Sappers, four regiments. At the beginning of 1898 the strength of the regular army on a peace footing was placed at 128,183, and on a war footing at 183,972. Including the forces maintained in the colonies, the actual number of troops in 1898 was much in excess of this. In Cuba alone it was estimated that as many as 200,000 troops were stationed, and it was said that the total number serving with the colors, both at home and in the colonies, was 360,000. At the beginning of 1898 the number of vessels launched was according to the *Statesman's Year Book*, 137, and the number in process of construction was 21. These figures, of course, include gunboats and torpedo craft. They were classified as follows: 1 battleship of the first class; 1 port defence ship; 9 cruisers of the first class (armored); 1 cruiser of the first class (protected); 7 cruisers of the second class; 11 cruisers of the third class; 80 gunboats, etc.; 27 torpedo craft. Vessels in process of construction, included, 1 battleship of the first class; 2 cruisers of the first class (armored); 12 gunboats, etc.; 6 torpedo craft of the first class. The names of the vessels lost during the year are given in the article SPANISH-AMERICAN WAR (q. v.). After the war the principal vessels in the Spanish navy were *Carlos V*, *Pelayo*, *Namancia*, *Cataluna*, *Cisneros*, *P. de Asturias*. These were all armored vessels with a tonnage ranging from 7,000 to 9,900. The deck-protected and partially protected vessels included the *Alfonso XII*, (5,000 T.), the *Alfonso XIII*, (4,800 T.), the *Le-panto* (4,800 T.), and the *Ensanada* (1,066 T.). Three cruisers were in process of construction. In the autumn of 1898 the *Rio de la Plata* (1,800 T.), was launched at Havre.

Finance.—It was estimated that the liquidation of the budget for 1897-98 was as follows: expenditures, \$165,145,974; revenue, \$155,607,799, making a deficit of \$9,538,175. The ordinary budget for 1898-99 was estimated as follows: expenditures, \$167,616,528; revenue, 167,102,660; deficit, \$513,868. This budget received the royal

assent on June 28, 1898. As compared with the budget of 1896-97, the estimated increase of expenditures was \$20,623,509, and of revenue, \$18,630,411. The minister of finance declared that in spite of adverse circumstances there was no falling off in the national wealth, or in the receipts of the national treasury. The expenses of the Cuban campaign were met by the Cuban bonds of 1890, by issues of customs bonds in November, 1896, May, 1897, and January, 1898, and by "delegations on security of revenue from stamp tax, tobacco monopoly, and tax on articles of food, April, 1898."

HISTORY.

Political Parties.—The chief divisions are Liberals and Conservatives, but they are subdivided into groups. As a result of the general elections of 1893, the Liberals of the Cortes numbered 322 and the Conservatives 48. Besides these parties there were the dissenting Conservatives, 15, the extreme Republicans, 23; the moderate Republicans, or Possibilists, 16, and the Carlists, 6. After the general elections of 1896 the political parties in the Cortes were distributed approximately as follows: Conservatives, 300; Liberals, 100; Carlists, 10; Independents, 10; dissenting Conservatives, 3. Since then party lines have been further confused on account of affairs in Cuba and the Philippines and the war with the United States. The Conservatives remained in power until a short time before the outbreak of the war in 1898.

The Cuban Question.—For an account of the causes of the war and the diplomatic negotiations that took place between the United States and Spain in connection with the Cuban difficulty, see the article UNITED STATES (paragraphs on History), and for an account of the military events, see the article SPANISH-AMERICAN WAR. The present article has to do only with internal affairs. The elections for the Cortes, held on March 27, 1898, returned about 300 Liberals and about 100 opposition members. The Liberals and the Conservatives were substantially in accord in supporting the monarchy, but there was much difference of opinion as to the proper policy to be pursued. The Cortes met on April 20 at the very time when the strained relations between Spain and the United States made war inevitable. The Queen Regent made a speech in which, after laying the blame for the situation upon the United States, she declared her intention to protect the interests of Spain and insure the succession of her son. Calling attention to the insults suffered from the United States in the past, she gave warning that if the latter power persisted in its scheme for the overthrow of Spanish sovereignty in Cuba, the Spanish government would break off diplomatic relations. There was much discussion in the Cortes, but nothing of practical value had been accomplished when the session came to a close on June 24. The Conservative ministry, which had been in power when the Cuban rebellion broke out continued in office for a long time owing to a lack of plans on the part of the opposition, but as the friction between the United States increased, a Liberal ministry under Señor Sagasta consented to form a cabinet avowedly with the aim of maintaining peace, and this peace ministry remained in office after the outbreak of the war. There were, however, serious differences of opinion among the members of the cabinet, and the ministry was reorganized, in May, 1898, though it still remained under the premiership of Señor Sagasta. The new ministers were Almadovar del Rio for Foreign Affairs; Giron for the Colonies; Auñon for Marine, and Gamazo for Public Works. This ministry remained in power throughout the war and no change occurred until October, when Señor Gamazo resigned.

Internal Disturbances.—In the spring and summer of 1898 there was much distress among the working classes and on several occasions the popular discontent assumed a threatening form. The most serious demonstrations against the government were the popular tumults which arose in many of the country districts, owing in part, to the scarcity of bread. As the war approached a rise in exchange took place and large quantities of grain and flour were exported. This occasioned much anxiety, because of its effect in raising the price of bread, the native supply of breadstuffs being hardly more than sufficient for the home demand and importations being checked by high tariff rates. Wool, raw silk, and other native products were also exported in increasing quantities, thus raising the price of the raw materials for manufactures. In response to the public demand the Cortes passed a law lowering the import duties on wheat and permitting exportations of flour, wheat, potatoes and other food. The bad economic conditions naturally led many people to demand the cessation of the war on any terms. Such a demand was made with especial emphasis by those manufacturers whose interests had been injured by the rise in price of raw products and who found themselves obliged either to shut down their factories, or to run them at a loss. Another thing that caused much popular discontent was the apparent danger of a depreciation of the paper currency, and the apprehension felt by the people showed itself in a distrust of the notes issued by the Bank of Spain. The Cortes met this difficulty by a law permitting the exportation of silver, and the popular uneasiness soon passed away. Political disturbances took place in the cities, especially in Madrid, which was the centre of a very bitter hostility toward the

United States. These demonstrations led the government to proclaim martial law in Madrid and other cities. It was said that this discontent was actively fomented by the Carlists and Republican parties. The Carlists seemed to be especially formidable, although they took pains to avoid the appearance of making use of the war with the United States as a means of gaining selfish ends. Don Carlos himself, who changed his headquarters from Italy to Brussels just before the outbreak of the war, declared that any Carlist who should take up arms against his country while the latter was involved in a war with the United States was a traitor. He also said that if the Spanish government did not accept the challenge made by the United States he would himself enter Spain and raise a body of volunteers to defend the honor of his country. At the same time he criticized as treasonable the unreadiness which the administration had showed. As the war went on, bringing its train of reverses to the Spanish arms, the government, as a precautionary measure against popular outbreaks suspended by decree the constitutional guarantees of civil liberty (July 15). This restricted the liberty of the press and abolished that protection of the individual against arbitrary detention in prison, which corresponds to the habeas corpus writ, in Great Britain and the United States. In the meanwhile (July 11), the Sagasta ministry had tested public opinion as to its policy by offering to resign. No one was ready to take up the difficult task of forming a ministry and the Sagasta cabinet remained in power.

On the whole, people showed a remarkable spirit of acquiescence in the results of the war when those results became definitely known. This spirit is perhaps explained by the deep impression which the publication of the cost of the operations in Cuba made upon the public mind. It was estimated that from March, 1895, to June, 1898, 2,000,000,000 pesetas had been spent, and that of the 200,000 Spanish soldiers sent to Cuba 55,000 lost their lives and 29,000 were invalided.

The Close of the War.—The Cortes met on September 5, and an active discussion soon followed upon the submission of a bill empowering the government to renounce its sovereignty over the colonies. Although much ill-feeling was shown in the debate the Conservatives continued to support the government and the bill was passed. On September 14, the Cortes suspended its session. Two days later General Toral, who had surrendered Santiago, arrived at Vigo with a body of Spanish veterans. The latter were in a wretched condition, many of them barefooted and scantily clothed, and the crowd gave vent to its indignation in hoots and hisses. So violent was the unreasoning anger of the mob towards their general that he returned to his ship, after which the crowd lined up on the shore and pelted the vessel with stones. Señor Gamazo's resignation from the ministry of Public Instruction and Public Works on October 21, was followed on the 24th of that month by the resignation of General Correa, as Minister of War. An impressive event, which occurred early in the year, was the transfer of the remains of Columbus from Havana to Spain. See CUBA, PHILIPPINE ISLANDS and PUERTO RICO; also ARCHÆOLOGY, SOCIALISM and SPANISH LITERATURE.

SPANISH-AMERICAN WAR. Early in January, 1898, the conditions in Cuba arising from the long period of indecisive warfare between the insurgents and the Spanish army became more grave than ever before. The two matters that chiefly held popular attention were the starvation of the *reconcentrados* in the Cuban provinces and the proposition of the Spanish Cabinet of Cuban autonomy. During the greater part of the previous year the Spanish authorities had been fairly successful in suppressing or denying the facts in regard to the real state of the Cuban peasantry. General Blanco, who succeeded General Weyler as commander of the Spanish forces in Cuba, began his administration by announcing that the *pacíficos* should be immediately relieved. It soon became known, however, that thousands of Cubans were slowly succumbing to starvation, and that General Blanco's own troops were insufficiently provided for. American relief was proffered, but the measure did not meet with Spanish approval, as it was thought to be preliminary to intervention, which had been advocated by many in the United States; and matters were further aggravated by the constant reports of brutality and outrage committed not only on men but on women and children by the officers and privates of the Spanish army.

The "Autonomy" Plan.—On November 23, 1897, the Spanish Cabinet approved the plan for autonomy in Cuba. By February it appeared to many in this country that the measure was not only insincere, but was a device to conciliate public opinion in the United States and to gain time for further prosecution of the Cuban War. That successful autonomy was impossible was seen from two facts, namely, the Spanish public and probably the Cortes opposed it, and the Cuban insurgents, who were struggling for absolute independence, could not be persuaded even to listen to the proposition. A Cuban Cabinet, however, was appointed, and General Blanco began the work by sending emissaries among the insurgents to bribe the leaders over to the Spanish side, whereupon there appeared numerous false dispatches announcing that certain of the insurgent officers had accepted the autonomy plan. This method of procedure was summarily stopped by the execution of General Blanco's

aid-de-camp, Colonel Ruis, in the camp commanded by the insurgent Rodriguez. The entire plan became so unpopular that on January 12, 1898, serious Spanish riots broke out in Havana, the mobs crying, "Down with autonomy!" "Hurrah for Weyler," and doing considerable damage.

American interests were not injured, but the situation was critical, and the Navy Department ordered the Atlantic squadron to rendezvous at the Dry Tortugas; as a further safeguard the battleship *Maine* proceeded, January 25, to Havana harbor. Although the Spanish authorities formally acquiesced in this, they undoubtedly looked upon it as another act on the part of the United States anticipating some plan of intervention, which both President Cleveland and President McKinley had suggested. At this time, while horrible destitution prevailed in Cuba, guerrilla warfare was being waged, and Spain was making further warlike preparations, a censorship having been placed on cable dispatches in Havana on January 14, and the Spanish fleet having been ordered on the 27th to concentrate at Cadiz.

The de Lome Incident.—On February 9 there was published a letter written by Señor Dupuy de Lome, the Spanish Minister at Washington, to Señor Canalejas, a Spaniard of high rank, in which not only insulting language was applied to President McKinley, but suggestions were made that the Spanish government was not acting in good faith toward the United States. Señor de Lome had been recognized as a diplomat of great shrewdness and ability, and the publication of this letter, the authenticity of which he was presently forced to admit, caused surprise and indignation. The letter was stolen in Havana, and made public by a member of the Cuban Junta. The State Department, through Minister General Woodford, immediately requested the withdrawal of Señor de Lome, but the Spanish Minister had anticipated this by telegraphing his resignation to Madrid, which was straightway accepted by the Spanish Cabinet. On February 14, the administration received an official communication from the Spanish government disclaiming any sympathy with the sentiment expressed in the letter, and professing regret for what had occurred. Señor du Bosc, the first secretary of legation, was appointed to act as minister, and on February 15, the announcement was made that Señor Luis Polo y Bernabe had received the permanent appointment. The relations between Spain and the United States, already strained by reason of the long continued Cuban outrages, were aggravated by the De Lome letter; but on the morning of February 16 there came news which created national consternation and caused many to believe that war was imminent.

The Destruction of the Maine.—At about ten o'clock on the night previous the battleship *Maine* was blown up and sunk near Fort Attares in Havana harbor, and 2 officers and 264 of the crew were killed. The explosion was terrific; the city was shaken, lights were extinguished, and presently the entire harbor was illuminated by the burning ship. Boats put out from a Spanish warship and from other vessels near at hand and every possible effort was made to save the crew. That so few officers were killed is due to the fact that some of the officers were visiting another ship in the harbor, and also that the explosion took place relatively near the bow while the officers' quarters were toward the stern of the ship. "I find it impossible," said Captain Sigsbee of the *Maine*, "to describe the sound or shock, but the impression remains of something awe-inspiring, terrifying—of noise, rending, vibrating, all-pervading." Captain Sigsbee knew that rumors had been rife to the effect that his ship would be destroyed and he knew of the bitter feeling, constantly growing more intense, of the Spanish authorities towards Americans; and yet, his ship destroyed and he himself in a dangerous, not to say hostile city, he telegraphed that the people of the United States should suspend judgment until a proper investigation had revealed the cause of the disaster. Though the situation was trying, the self-control of the whole people was remarkable. While it seemed incredible that a visiting warship could be destroyed in time of peace by Spanish authorities, it seemed impossible that it could have been destroyed in any other way. A committee of investigation was appointed by the President, and divers immediately began work on the wreck. The request of the Spanish officials in Havana for a joint investigation was refused by our government, but all facilities were granted them for making a separate though somewhat later inquiry. For a week or two conservative opinion inclined to the theory of internal explosion; people did not want to believe anything else. But by the end of February it was generally believed that the Court of Inquiry appointed to investigate the affair, would find that a mine had been the cause of the disaster. This court, consisting of Captain Sampson, of the *Iowa*, Lieutenant Marix, Commander Potter, of the *New York*, and Captain Chadwick, of the same vessel, arrived at Key West on February 27. Its sessions, which were held at Key West and Havana, were prolonged for more than three weeks; on March 22 Lieutenant Marix started for Washington with the report which was made public three days later. With the publication of the American Court of Inquiry came the Spanish report, which said, "It is scientifically and practically demonstrated that the explosion was internal." President McKinley sent the American report to Congress together with the testi-

mony taken by the Court and a short message, in which he stated the facts relating to the visit of the *Maine* to Havana, and made the following statement of the findings of the Court of Inquiry:

"When the *Maine* arrived at Havana, she was conducted by the regular Government pilot to buoy No. 4, to which she was moored in from five to six fathoms of water.

"The state of discipline on board, and the condition of her magazine, boilers, coal-bunkers and storage compartments, are passed in review, with the conclusion that excellent order prevailed and that no indication of any cause for an internal explosion existed in any quarter.

"At 8 o'clock, on the evening of February 15, everything had been reported secure and all was quiet. At 9:40 o'clock the vessel was suddenly destroyed.

"There were two distinct explosions, with a brief interval between them. The first lifted the forward part of the ship very perceptibly; the second, which was more open, prolonged, and of greater volume, is attributed by the court to the partial explosion of two or more of the forward magazines.

"The evidence of the divers establishes that the after part of the ship was practically intact, and sank in that condition, a very few minutes after the explosion. The forward part was completely demolished.

"Upon the evidence of a concurrent external cause the finding of the Court is as follows:

"At frame 17 the outer shell of the ship, from a point eleven and one-half feet from the middle line of the ship and six feet above the keel, when in its normal position, has been forced up so as to be now about four feet above the surface of the water; therefore about thirty-four feet above where it would be had the ship sunk uninjured.

"The outside bottom plating is bent into a reversed V-shape, the after wing of which, about fifteen feet broad and thirty-two feet in length (from frame 17 to frame 25), is doubled back upon itself against the continuation of the same plating extending forward.

"At frame 18 the vertical keel is broken in two and the flat keel bent into an angle similar to the angle formed by the outside bottom plates. This break is now about six feet below the surface of the water and about thirty feet above its normal position.

"In the opinion of the Court, this effect could have been produced only by the explosion of a mine situated under the bottom of the ship, at about frame 18, and somewhat on the port side of the ship.

"The conclusions of the Court are:

"That the loss of the *Maine* was not in any respect due to fault or negligence on the part of any of the officers or members of her crew.

"That the ship was destroyed by the explosion of a sub-marine mine, which caused the partial explosion of two or more of her forward magazines; and,

"That no evidence has been obtainable fixing the responsibility for the destruction of the *Maine* upon any person or persons."

The documents were referred in the Senate to the Committee on Foreign Relations and in the House to the Committee on Foreign Affairs.

Preparations for War.—During the time pending the report of the Court of Inquiry, both the United States and Spain were making preparations for war, though both governments were loath to admit that war seemed imminent. On February 26 the Navy Department asked for the enlistment of 1,500 more men as crews for the *Columbia* and the *Minneapolis*; and the Spanish Ministry, though making a reassuring statement regarding the relations of Spain and the United States, voted 1,000,000 pesetas for the Spanish navy. On the following day Premier Sagasta said that no Spanish government would consent to arbitrate the Cuban trouble, and *La Correspondencia Militar*, the organ of the army, announced that war with the United States was expected in April. In the early part of March the War Department made contracts for a million dollars worth of projectiles, and Secretary of the Navy Long directed Captain Brownson to go to Europe for the purpose of negotiating the purchase of warships with England, France and Italy; about the same time the Spanish transport steamer *Alfonso XII* sailed from Barcelona for Cuba with about 900 soldiers and 4,000,000 cartridges. A few days later the United States purchased the Brazilian cruisers *Amazonas* and *Admirante Abreusall* (renamed *New Orleans* and *Albany*), which were being finished in an English ship yard, and the Spanish squadron sailed from Cadiz presumably for Puerto Rico. The American Congress had already made the famous \$50,000,000 appropriation. On March 8 upon the motion of Representative Joseph G. Cannon, of Illinois, the House unanimously voted that an appropriation of \$50,000,000 be placed at the unqualified disposal of President McKinley "as an emergency fund for national defense;" and on the following day the bill passed the Senate, also by unanimous vote. The appropriation of this large sum was looked upon as a peace measure, it being hoped that Spain would be intimidated by such unanimous and spontaneous action on the part of our government. But in

about two weeks the Madrid government arranged for a loan of 200,000,000 pesetas with the Bank of Spain. On April 1, the House passed the naval appropriation bill, which carried a total of more than \$39,000,000 in direct appropriations. During this time negotiations with Spain for a settlement of the Cuban question continued, but our government had also entered upon negotiations for the acquisition of St. Thomas (these proved unsuccessful), Commodore Schley had taken command of the "flying squadron" at Hampton Roads, and the warships at Key West, under the command of acting Rear-Admiral Sampson, had been stripped for action.

Both Congress and the people had sunk the question of the *Maine* in the larger one of Cuban independence. Destitution among the *reconcentrados* was constantly growing worse, thousands dying slowly from starvation. American supplies were distributed to the sufferers through Miss Clara Barton, President of the Red Cross Society, and General Fitzhugh Lee, our Consul at Havana. Spain thereupon not only requested that the supplies be carried in merchant vessels instead of armed cruisers, but intimated that the recall of Consul-General Lee was desired. The United States promptly acquiesced in the former request, but flatly refused to recall General Lee, who was showing remarkable ability and firmness in the performance of his difficult duties.

On March 31 Captain-General Blanco issued a decree putting an end to reconcentration in the provinces of Pinar del Rio, Havana, Matanzas, and Santa Clara, and on April 9 the Spanish Cabinet decided to grant an armistice to the insurgents, while both the Pope and the great Powers of Europe were using their influence to avert a Spanish-American war. Nevertheless the replies at this time of the Madrid government to President McKinley's demands concerning the pacification of Cuba, notwithstanding the Spanish offer to arbitrate the *Maine* trouble, led the authorities at Washington to believe that pacification could not be attained without the armed intervention of the United States. The President's message to Congress, which was daily expected, was withheld, through the advice of Consul-General Lee, until April 11. General Lee conceived that the message would precipitate an anti-American demonstration in Havana, and he wished to give Americans opportunity to leave the island. He himself arrived in Washington on the 12th. Both Congress and the people had grown impatient waiting for the message, and when it finally came excitement was at such a height that many condemned it for its conservatism. It was, however, a wise and ably conceived document. The President stated the entire issue, rightly considering the *Maine* disaster a subordinate matter, and passed in review Spanish mismanagement and outrage in Cuba, and the repeated promises and the repeated failures of the Spanish government to effect suitable reforms. Referring to the *reconcentrados* and to the fact that by March, 1897, over fifty per cent. of their number had perished, he said, "It was not civilized warfare. It was extermination. The only peace it could beget was that of the wilderness and the grave."

The conclusion of the long message and the really important part was as follows:

"The only hope of relief and repose from a condition which can no longer be endured is the enforced pacification of Cuba. In the name of humanity, in the name of civilization, in behalf of endangered American interests, which give us the right and the duty to speak and act, the war in Cuba must stop.

"In view of these facts and of these considerations, I ask the Congress to authorize and empower the President to take measures to secure a full and final termination of hostilities between the government of Spain and the people of Cuba, and to secure in the island the establishment of a stable government capable of maintaining order and observing its international obligations, insuring peace and tranquility and the security of its citizens, as well as our own, and to use the military and naval forces of the United States as may be necessary for these purposes.

"And in the interest of humanity and to aid in preserving the lives of the starving people of the island, I recommend that the distribution of food and supplies be continued, and that an appropriation be made out of the public treasury to supplement the charity of our citizens.

"The issue is now with the Congress. It is a solemn responsibility. I have exhausted every effort to relieve the intolerable condition of affairs which is at our doors. Prepared to execute every obligation imposed upon me by the Constitution and the law, I await your action."

To this he added a reference to the armistice just declared by General Blanco, and, though having little faith in it, he said, "If this measure attains a successful result, then our aspirations as a Christian, peace-loving people will be realized. If it fails, it will only be another justification for our contemplated action." It may be said here that the armistice was no real armistice at all; the revolutionary party in Cuba would not accept it any more than they would the autonomy plan.

On April 13 the House passed, by a vote of 322 to 19, the following resolution:

"That the President is hereby authorized and directed to intervene at once to stop the war in Cuba, to the end and with the purpose of securing permanent peace and order there and establishing, by the free action of the people thereof a stable and

independent government of their own in the island of Cuba; and the President is hereby authorized and empowered to use the land and naval forces of the United States to execute the purpose of this resolution."

The framing of resolutions in the Senate took much longer; the spirit of "Jingoism" was very manifest. The resolutions finally adopted by the Senate differed from those of the House chiefly in that they recognized the Republic of Cuba. A compromise was effected whereby the House agreed to the Senate resolutions verbatim, with the exception of the clause on recognition. The resolutions thus changed were accepted by both Houses in the small hours of the morning of April 19,—by the Senate, by a vote of 42 to 35, and by the House by a vote of 310 to 6,—and were signed by the President on the following day. Three chief classes of arguments upon the Cuban trouble had been offered at this time. The first was that of the "peace-at-any-price" men who insisted not only that intervention was illegal, but that it would aggravate the sufferings of the *reconcentrados*. This attitude aroused very little sympathy in the country at large. The second may be called the "jingo" argument, which demanded war apparently for its own sake, insisted upon the immediate recognition of the Cuban Republic, and was probably influenced more by the *Maine* disaster than by any broad and dispassionate policy. The third class of arguments came from the men who wanted peace, who applauded the President for doing everything in his power to maintain an honorable peace, but who, like the President, were determined upon war if war alone could annul Spanish rule in Cuba. It was largely this spirit which was expressed in the resolutions finally adopted by Congress. The following is the text of the act with its preamble and title:

"Joint resolution for the recognition of the independence of the people of Cuba, demanding that the government of Spain relinquish its authority and government in the island of Cuba and withdraw its land and naval forces from Cuba and Cuban waters, and directing the President of the United States to use the land and naval forces of the United States to carry these resolutions into effect.

"Whereas, The abhorrent conditions which have existed for more than three years in the island of Cuba, so near our own borders, have shocked the moral sense of the people of the United States, have been a disgrace to Christian civilization, culminating, as they have, in the destruction of a United States battleship, with two hundred and sixty of its officers and crew, while on a friendly visit in the harbor of Havana, and cannot longer be endured, as has been set forth by the President of the United States in his message to Congress of April 11, 1898, upon which the action of Congress was invited; therefore be it resolved:

"First—That the people of the island of Cuba are, and of right ought to be, free and independent.

"Second—That it is the duty of the United States to demand, and the government of the United States does hereby demand, that the government of Spain at once relinquish its authority and government in the island of Cuba and withdraw its land and naval forces from Cuba and Cuban waters.

• "Third—That the President of the United States be, and he hereby is, directed and empowered to use the entire land and naval forces of the United States, and to call into active service the militia of the several States to such an extent as may be necessary to carry these resolutions into effect.

"Fourth—That the United States hereby disclaims any disposition or intention to exercise sovereignty, jurisdiction, or control over said island, except for the pacification thereof, and asserts its determination when that is accomplished to leave the government and control of the island to its people."

On the 20th of April the President signed his ultimatum to the Spanish government, a copy of which was handed to Minister Polo, who immediately demanded his passports and started for Canada, leaving the interests of the Spanish legation in charge of M. Cambon, the French Minister. Before receiving the ultimatum the Spanish Cabinet delivered to Minister Woodford his passports and informed him that diplomatic relations with the United States were at an end. On the 25th a bill was passed by Congress declaring that a state of war existed between the United States and Spain, and had so existed since and including April 21.

In the meantime war preparations were being pushed forward by both governments. The Queen-Regent signed a decree asking for a national subscription to the navy, our own navy was increased by the purchase of many more ships of various kinds, and by the middle of the month the troops throughout the country were preparing to move towards the Gulf. On the 17th two companies of the Twenty-fifth Infantry reached Key West and two days later a general movement of regular troops began. The principal rendezvous was Chickamauga, but New Orleans, Mobile, and Tampa were also places of mobilization. The President issued a call for 125,000 volunteers on April 23, which though meeting with immediate response received not a little adverse criticism, the dissatisfaction arising from the fact that in some States the infantry and artillery requisitions were not consistently apportioned, and from the fact that the Department of War proposed to use its privilege, if it chose, of destroying

the integrity of State organizations when the troops were beyond the State boundaries. A few days later orders were issued for recruiting the regular army up to its war strength, 61,000. On the 21st the fleet under acting Rear-Admiral Sampson at Key West was ordered to proceed to Havana and then institute a general blockade of the western end of Cuba. Commodore Schley with the "flying squadron" was detained at Hampton Roads in order to meet any attack which might be made on the coast cities by the Spanish Cape Verde fleet, reports from which for a number of weeks subsequent were contradictory and alarming.

Beginning of the War.—The first shot of the war was fired on Friday, April 22, by the gunboat *Nashville*, which captured and took to Key West the lumber ship *Buenaventura*. The claim that the cargo was the property of neutrals led the administration to emphasize its determination to maintain the four chief principles of the Declaration of Paris, although this country was not a party to that treaty: (1) Privateering abolished; (2) Neutral flags to exempt from capture an enemy's goods except contraband of war; (3) Neutral goods under an enemy's flag exempt from capture; (4) A blockade to be binding must be effective. See UNITED STATES.

During the rest of the month many prizes were taken in western Cuban waters. It was not the purpose of Admiral Sampson to bombard Havana or expose his fleet to the enemy's fire from coast fortifications before he was assured of the destination of the Spanish Cape Verde and Cadiz fleets; but at the same time he determined to prevent the erection of any new fortifications. This brought about the first action of the war, the bombardment of the works in process of construction at Matanzas, April 27. A rapid and well-directed fire from the flag ship *New York*, the *Cincinnati*, and the monitor *Puritan* was kept up for twenty minutes, completely demolishing the works. The American ships suffered absolutely no loss, for although the Spaniards made a spirited reply to the attack, their shots all fell short.

The natural move on the part of the United States, to be made as soon as possible, was the invasion of Cuba, but this was rendered highly inexpedient on account of the unknown position of the Spanish fleet under Admiral Cervera. This fleet had proceeded early in April to the Cape Verde Islands, which belong to Portugal, and had remained there until it was forced to leave on the 29th by Portugal's declaration of neutrality. It sailed away to the west. It was variously supposed that the fleet was bound for our eastern coast,—whereupon there ensued no little apprehension in our ports from Portland to Key West,—or for Porto Rico, Spain's principal base of supplies, or for the coast of Brazil, where it would intercept the American battleship *Oregon*, which had left San Francisco on Mar. 19 and after one of the most remarkable runs on record reached Jupiter Inlet, Fla., on May 24, with its machinery in as good condition as when it started. In the meanwhile, on May 4, Rear-Admiral Sampson sailed eastward from Key West with his flagship *New York*, the battleships *Iowa* and *Indiana*, the cruisers *Cincinnati*, *Detroit*, and *Marblehead*, the monitor *Puritan*, and the torpedo-boat *Mayflower*, under directions to intercept, if possible, and defeat the Spanish squadron. The location of Admiral Cervera's fleet remained an uncertainty until the report came on May 10 that he had returned to Cadiz; on the following day Admiral Sampson learned this from a dispatch boat from St. Thomas. The American fleet then proceeded to San Juan de Puerto Rico, the fortifications of which were shelled on May 12. Much damage was inflicted, but little sustained by the fleet. Two days later, as the Admiral was returning along the north coast of San Domingo, he learned from Porto Plata that the report of the fleet's being at Cadiz was only a Spanish ruse and that, on the very morning of the bombardment of San Juan, Admiral Cervera had arrived at Martinique. The American fleet under Admiral Sampson then proceeded to occupy the Windward Passage, between eastern Cuba and Haiti, while Commodore Schley's squadron had been ordered south on May 13, apparently to guard the Yucatan Passage off the western end of Cuba. On May 19, it was reported that Cervera had put into Santiago de Cuba. In the meantime the blockade of western Cuba had been maintained under the command of Commodore Watson. The blockading vessels off Cardenas were fired upon by the shore batteries May 11, and the torpedo-boat *Winslow* was seriously damaged; Ensign Worth Bagley and four sailors were killed. Ensign Bagley was the first American officer killed in the war. On the same day the telegraphic cable at Cienfuegos was cut by American sailors under fire.

Battle of Manila Bay.—The greatest interest of the war, however, was centered during the month of May not in the West Indies, but in the Philippines. England's declaration of neutrality forced the United States Asiatic squadron, which was at Hong-kong under the command of Commodore George Dewey, to leave that port. The squadron consisted of the flagship *Olympia*, a first-class protected cruiser (5,870 tons), the cruisers *Baltimore* (4,413), *Raleigh* (3,213), *Boston* (3,000), the gunboats *Concord* (1,710), and *Petrel* (892), the despatch boat *McCulloch*, and the two colliers bought by Commodore Dewey at Hong-kong. The Commodore sailed from this port April 25 with orders to engage and if possible destroy the Spanish fleet under Admiral Patricio Montojo y Pasaron, which was lying in Manila harbor in the

island of Luzon. From the point of view of naval tactics it is clear that this was the only correct move for the American squadron to make; the nearest friendly port, Honolulu, was 5,500 miles away. And it was highly desirable both that the American Pacific coast cities be relieved from fear of attack, and that Spain be cut off from her valuable sources of supply in the Philippines. The squadron reached Manila bay at night on Saturday (Manila time), April 30. With lights out and men at the guns, it steamed on, the flagship leading, and though it was moonlight this ship was a mile beyond the island of Corregidor before the enemy were aware of the presence of the fleet. They immediately opened fire and reply was made, but without stopping. Proceeding slowly the squadron came at daybreak in sight of the Spanish ships off Cavité. The shore batteries directed a vigorous fire at the squadron, but Commodore Dewey moved on, throwing a few shells into the batteries as he passed, and quite regardless of the submarine mines, two of which exploded directly in front of his ships; he arranged his ships so that they could pass in line by the Spanish fleet, tack about and pass again, thus performing an elliptical manœuvre, and shelling the fleet each time as they went. Shortly before six the order was given to open fire and the *Olympia* immediately threw a shell at the Cavité fort 5,500 yards distant; soon a heavy fire was being given and received. Immediately a great difference in the Spanish and American gunnery was apparent, for the shots from Dewey's fleet were usually effective, while the Spanish shells fell all about our ships but did little damage. Gradually the American fleet drew nearer the enemy, passing Admiral Montojo's ships five times. At this point, after almost exactly two hours' fighting, the Spanish fire slackened, and Commodore Dewey ordered the fleet to cease firing and follow the flagship. Thereupon the American vessels withdrew to the other side of the bay, the crews rested and took breakfast; fresh ammunition was made ready, and the guns and armament were examined. The interval lasted about three hours. The engagement was then renewed and one by one the ships of the already disabled and battered fleet were sunk. The battle was ended at half past twelve when a white flag was raised over the Arsenal at Cavité. The *Petrel* was sent in the afternoon to destroy the ships in the inner harbor, and toward night when the squadron had proceeded up the bay to Manila, Commodore Dewey sent a characteristically laconic message to the authorities, namely, that if another shot was fired he would lay the city in ashes.

So long as Commodore Dewey was outside the harbor, the odds were against him, but, once inside, the tables were turned, for the Spanish fleet while larger was somewhat weaker than the American. Having considered all the conditions, Dewey had carefully and scientifically planned the battle, and the result was something like what he had expected. Aside from the skilful leadership, the one thing that gained the victory was the accurate marksmanship of the American gunners. Both sides fought bravely. The Spaniards at times displayed an almost fanatical zeal in their disregard of danger. It was a battle of bravery and skill matched against bravery alone. Admiral Montojo lost his flagship, the *Reina Cristina*, early in the fight. The Spanish loss was heavy, between 300 and 400 killed and twice as many wounded; while Commodore Dewey lost not a single man. It is said that this is the only naval fight in history in which one fleet was annihilated without the loss of a man on the other. The most important Spanish ships were the *Reina Cristina*, the *Castilla*, and the *Don Antonio de Ulloa*. Neither squadron contained what is technically known as an armored vessel. See Map accompanying the article PHILIPPINES.

Commodore Dewey's two official despatches aroused great enthusiasm. They were as follows:

"Manila May 1.—Squadron arrived at Manila at daybreak this morning. Immediately engaged the enemy, and destroyed the following Spanish vessels: *Reina Cristina*, *Castilla*, *Don Antonio de Ulloa*, *Isla de Luzon*, *Isla de Cuba*, *General Lezo*, *Marquis de Duero*, *Cano*, *Velasco*, *Isla de Mindanao*, a transport, and water battery at Cavité. The squadron is uninjured and only a few men are slightly wounded. Only means of telegraphing is to American Consul at Hong-kong. I shall communicate with him. "Dewey."

"Cavité, May 4.—I have taken possession of naval station at Cavité, on Philippine Islands. Have destroyed the fortifications at bay entrance, paroling the garrison. I control bay completely and can take city at any time. The squadron is in excellent health and spirits. Spanish loss not fully known, but very heavy. One hundred and fifty killed, including Captain of *Reina Cristina*. I am assisting in protecting Spanish sick and wounded: two hundred and fifty sick and wounded within our lines. Much excitement at Manila. Will protect foreign residents. "Dewey."

For this brilliant victory Commodore Dewey was made a Rear-Admiral. Although it is obvious that Manila was at the Admiral's mercy, it is equally clear that he did not have a sufficient force for governing the city or for subduing other towns in the island. And, furthermore, he feared trouble with the insurgents, who had been in an almost constant state of hostility toward the Spaniards for two years. Aguinaldo, the principal leader, had returned to the islands with Dewey's squadron, and his arrival, as well as that of the American fleet, gave new courage to the natives who, like

the Cuban insurgents, were striving against the injustice and cruelty of Spain. But though great cordiality existed between Aguinaldo and the American Admiral, the latter knew that the overthrow of Spanish rule in Manila at that time would result in native occupation of the city with the attendant horrors of plunder and massacre,—a situation which would subsequently be very awkward for American arms.

Preparations for Philippine Occupation.—Preparation was immediately made by the Washington government for sending troops and supplies to the Philippines, but three weeks elapsed before the first expedition started. It seems that such preparations should have been begun as soon as Dewey was ordered to Manila. On May 16 a new military department of the Pacific, including the Philippines, was created. At this time it was announced that Major-General Wesley Merritt, U. S. A., commanding the Department of the East, and stationed at New York, had been appointed Military Governor of the Philippines, and would undertake the conquest of the islands with about 30,000 men. It was at first thought that 10,000 or 15,000 men would be sufficient, but General Merritt insisted on 30,000, including 5,000 regulars. The cruiser *Charleston* left Mare Island Navy Yard on May 21 bound with supplies for the Philippines, two days later the Fifth Regiment of California Volunteers embarked at San Francisco, and on the 25th the transports *City of Peking*, *City of Sydney*, and *Australia*, carrying about 2,500 men, ammunition and naval stores, and a year's supplies, left the same port. Most of the volunteers were from western States; the expedition was commanded by Brigadier-General Thomas M. Anderson, U. S. V. General Merritt arrived in San Francisco on the 27th, and took personal charge of the Department of the Pacific; a few days after his force was increased to 20,000 men. The second Philippine expedition, consisting of the transports *China*, *Colon*, *Zealandia*, and *Senator*, carrying 4,200 men under the command of Brigadier-General F. V. Greene, U. S. V., left San Francisco June 15. The monitor *Monterey* sailed from San Diego June 11, and the monitor *Monadnock* sailed from San Francisco June 23. Four days later the third expedition, consisting of the transports *Indiana*, *Ohio*, *Morgan City*, and *City of Para*, sailed from San Francisco under the command of General Arthur McArthur. On the 29th General Merritt sailed for Manila, and the day after the three transports of the first expedition, convoyed by the cruiser *Charleston*, arrived at Cavité. *En voyage* the cruiser, commanded by Captain Glass, had surprised the Spanish officials in the Ladrone islands, who had not learned that a state of war existed between the United States and Spain, and who were compelled by the Americans to go aboard the *Charleston* as prisoners of war, June 21, while the Spanish flag was hauled down and the Stars and Stripes raised over the islands. General Merritt reached Cavité July 25.

During this time the Philippine insurrection had been gaining in force, under the leadership of Aguinaldo and other chiefs, and the Spanish troops were being harassed and slowly forced back toward the intrenchments at Manila. Early in June, Admiral Dewey reported that the insurgents had taken 1,800 prisoners, including 50 officers, and by the 20th of the month they held 4,000 prisoners, had formally declared the independence of the islands, and had chosen Aguinaldo president. Don Basilio Augusti, Governor-General of the islands, realized his weakness, and before June 8 had telegraphed to the Madrid government that without reinforcements he could not hold out at Manila. Soon after there came reports that the Cadiz fleet under Admiral Camara was preparing to sail for the Philippines by way of the Suez Canal. The situation of Admiral Dewey at Manila was very trying, yet not only up to this time, but during the subsequent events of the Philippine campaign, he showed qualities both of a brave and able fighter and of a statesman of great shrewdness, tact, and foresight.

Further Preparation for War.—The work of mobilization had progressed steadily during this time. About the middle of May, 12,000 men were at Chickamauga Park, and on the 20th, 104,000 volunteers had been mustered in. The war estimates and appropriations up to this time aggregated \$295,210,840, and the actual government expenditures for the month of May were \$17,800,000 in excess of the receipts. Camp Alger was established near Washington, and Camp Black at Hempstead, Long Island. On May 25 President McKinley issued his second call for volunteers, the requisition being for 75,000 men. This would make the total army strength, regulars and volunteers, 278,000. Both the first and second calls of the President for volunteers met with hearty response. By the 27th of May, 120,544 men had been mustered in; a shortage was reported in the quotas of Alabama, Iowa, Kentucky, Mississippi, and North Carolina. In the latter part of June, Congress authorized Secretary Gage to issue bonds immediately to the extent of \$200,000,000. Shares were made for \$20 or multiples of that number, and preference was given to the smallest subscriptions, thus insuring an actually popular loan. The entire amount was covered in a few days. A war revenue law went into effect July 1, by which it was thought an additional yearly income of from \$200,000,000 to \$300,000,000 would be realized. The bill was very complicated. It was thought that a chief part of the revenue would be received from the increased tax on beer and tobacco. The stamp system was very

prominent, it being necessary to place stamps on a vast number of commodities, chiefly luxuries. A notable innovation was the use of stamps on checks and various other commercial papers, as well as on telephone and telegraph messages. See UNITED STATES.

The Beginning of the Campaign at Santiago de Cuba.—When it was rumored on May 19 that the Cape Verde Squadron, commanded by Admiral Cervera, had put into the harbor of Santiago, on the southern coast of Eastern Cuba, Commodore Schley, who was with the "flying squadron" off the southern coast of the western end of the island, sailed for Santiago, having assured himself that Cervera was not in the harbor of Cienfuegos. The harbor of Santiago is well within the land, being connected with the sea by a tortuous passage, difficult of navigation and so narrow at one point that large ships must pass in single file. High bluffs on each side, made it impossible to detect the presence of ships in the inner harbor, from any position outside in the open sea. Thus it was not until May 29 that Commodore Schley was certain of the presence of the fleet in the harbor. Subsequently it became known that Schley was reluctant to obey Sampson's orders to maintain a blockade of Santiago, and it was most fortunate that during the former's uncertain movements Cervera did not escape. On June 1, Admiral Sampson arrived with his heavy squadron. There were now about a dozen American ships lying off the harbor entrance, including the *New York* (Admiral Sampson's flagship), *Iowa*, *Oregon*, *Indiana*, *Brooklyn* (Commodore Schley's flagship), *Massachusetts*, *Texas*, *New Orleans*, and *Marblehead*. The channel into the harbor was thoroughly mined and on the east side of the entrance was the strong fortification, El Morro, and on the west side but somewhat farther in was La Socapa. Commodore Schley bombarded these batteries on May 31 and also engaged the *Cristobal Colon*, Admiral Cervera's flagship, which lay close behind the harbor entrance. The purpose of the engagement was to reconnoitre the harbor as far as possible, to test the accuracy of the Spanish gunners, and to locate the position of the masked batteries. As was expected the Spanish gunnery was very poor, for, although the action lasted fifty-five minutes, not one of the American ships was struck. The *Massachusetts* (to which the Commodore temporarily changed his flag), the *New Orleans*, the *Iowa*, and the little *Vixen* took part in the bombardment.

The Blocking of the Santiago Channel.—As soon as Cervera's fleet was definitely located in the harbor, it was clear that its destruction or detention signified the end of the first part of the war. With this fleet removed from action, our coast cities would be free from danger, our transports could safely proceed with troops to Cuba, and the siege of Cuban ports could be conducted with much greater hopes of speedy success. Moreover, the Cadiz fleet of Admiral Camara would naturally remain to defend the coast of Spain and thus Admiral Dewey would be relieved from apprehension. In the day-time and in fair weather there was little likelihood of Cervera's effecting a successful escape from the harbor; but there was some danger that the attempt might be made at night, or during some storm when the American fleet would be necessarily scattered. It was important, therefore, that some plan be effected for the blocking of the channel. With Admiral Sampson's fleet came Lieutenant Richmond Pearson Hobson, a young naval constructor, who submitted a plan to the Admiral, complete in every detail, for sinking the collier *Merrimac* crosswise in the harbor beyond the Estrella batteries, where the channel was only one hundred feet wide; in this way the Spanish fleet would be securely shut in. The Admiral gave his assent and the attempt was to be made on the night succeeding their arrival, but, as the collier could not be prepared in time, the actual exploit was made before dawn on the morning of June 3. Although the attempt seemed to mean certain death, hundreds of men volunteered to assist Lieutenant Hobson. The following were the men finally chosen for the desperate undertaking: Osborn Deignan, a coxswain; John Kelly, a water-tender; George F. Phillips, a machinist, all three of the *Merrimac*; George Charette, a gunner's mate, of the *New York*; Daniel Montague, a seaman of the *Brooklyn*; J. C. Murphy, a coxswain of the *Iowa*. Randolph Clausen, a coxswain of the *New York*, who was at work on the *Merrimac*, refused to leave her, and so was one of the crew. At 2:30 these men took the collier toward the western side of the harbor entrance and then moved up the channel opposite El Morro to the narrow point about opposite La Socapa and beyond the Estrella batteries. Naval Cadet Joseph W. Powell, with four men, followed the *Merrimac*, in the launch of the *New York*. Although they were under a terrific fire the desired position was reached, the bonnets of the collier's sea-valves were removed, the helm was put hard to starboard, thus swinging the ship across the channel, and a few moments later seven charges, aggregating eighty pounds of powder, were fired. The rudder, however, was partly shot away and the men were not able to swing the boat to the exact position desired. The terrific cannonade, at so short a range allowed the Spaniards completely to riddle the boat. Fire was also opened on the little launch, which was searching for the crew of the *Merrimac*. At the same time the ships of Admiral Sampson and Commodore Schley, which had been arranged in a semi-circle extending for about five miles outside the harbor entrance, opened fire on the batteries. For a little time



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the firing on both sides was furious in the extreme, and the appearance of the channel was a great sheet of flame from the guns. In the morning the masts of the *Merrimac* were seen standing out of the water, apparently where Lieutenant Hobson had proposed to put her. The launch had failed to find Hobson or his men, and at first it was thought they had perished; but during the forenoon an officer came from Admiral Cervera under a flag of truce to the *New York* and announced that the men had put off from the *Merrimac* in a small catamaran, and had been taken on board a Spanish vessel. Two were slightly wounded. The officer announced that on account of their bravery, they would be treated with great consideration. This exploit of the sinking of the collier with her two thousand tons of coal was as brave a deed as can be found in the annals of naval warfare.

Shafter's Expedition.—It was seen that a patrol fleet would be required to prevent the Spaniards from removing the wreck of the *Merrimac*, and as the American ships were in constant danger of being forced temporarily to sea on account of the approach of the season of tropical storms, the immediate capture or destruction of Cervera's fleet and the capture of Santiago became necessary. Therefore the Fifth Corps of the United States Army, comprising about 16,000 troops, under the command of Major-General William R. Shafter, U. S. V., which was stationed at Tampa, Florida, made ready to sail for Santiago and invest the city. The expedition finally included the Seventy-first New York Volunteers, the Second Massachusetts Volunteers, and the First Volunteer Cavalry, popularly known as "Roosevelt's Rough Riders." It was thought that departure from Tampa would be made about June 6. Apparently inexcusable delays, however, ensued, and it was not until June 16 that the thirty-five transports left Key West under convoy of the battleship *Indiana* and about a dozen smaller ships. The troops were landed from June 21 to 23 at Daiquiri, seventeen miles east of the harbor entrance.

In the meantime the American fleet repeatedly engaged the shore batteries. On June 4 it was reported that the telegraphic cables connecting eastern Cuba with Jamaica and Haiti, and the coast loop between Santiago and Guantanamo had been cut. It was thought that this would isolate Captain-General Blanco, but it was not until much later that this was actually accomplished. Admiral Sampson on June 6 bombarded the Santiago batteries and the port of Aguadores a few miles to the east. Our ships having formed in a double line—the one composed of the *New York*, *Oregon*, *Iowa*, *Yankee*, and *Dolphin*; the other composed of the *Brooklyn*, *Texas*, *Massachusetts*, *Suwanee*, and *Vixen*—advanced to about 4,000 yards of El Morro and poured such a well-directed fire upon the fortifications that the Spaniards were driven from their guns amid an immense destruction of masonry and earthworks. The Spanish cruiser *Reina Mercedes*, lying within the harbor, was seriously damaged and a few days later was reported a wreck. The American fleet was practically uninjured although the *New York* approached to within 1,000 yards of the mouth of the harbor. On the following day the auxiliary cruiser *St. Louis*, under the protection of the *Marblehead* and the *Yankee*, cut the cable at Caimanera in the bay of Guantanamo forty miles east of Santiago; this was followed by a bombardment and the silencing of the forts. The reduction of the fortifications was completed on the 15th. This prepared for the landing of 600 marines under command of Lieutenant-Colonel R. W. Huntington near the entrance of the Guantanamo bay on June 10. No difficulty was experienced in landing, but later in the day the Spaniards, who were in the woods and apparently numbered several thousand, began a harassing fire and a series of attacks that continued for several days. Finally on June 14 the marines assumed the offensive, and charging the enemy, drove them from the camp, while the *Marblehead* shelled the woods. In this engagement the Cuban allies rendered effective assistance. On June 21 a conference was held between Admiral Sampson and Generals Shafter and Garcia (the Cuban insurgent leader); two days later the Socapa battery was destroyed by the *Texas*.

General Shafter's army, as before stated, was completely disembarked on June 23; the main landing-place was Daiquiri, but the landing-places near the towns of Aguadores and Siboney were also used. The landing was effected without any difficulty largely by the aid of a ruse which led the enemy to believe that the troops would disembark at Cabañas, two and a half miles west of Santiago bay. Some of the troops moved immediately from Daiquiri to Demajayabo and encamped there the first night. The Spanish intrenchments extended from the town Aguadores—about two miles inland and three miles east of El Morro—in a northeasterly direction, keeping the line about four miles from Santiago. At important points these fortifications were especially strong. The purpose of General Shafter was to extend his lines along the whole distance of Spanish intrenchments, and force the entire American army through as soon as possible, for he knew the torrid climate and the rains would weaken his troops.

Battle of Las Guasimas.—General Joseph Wheeler went forward with 964 men from his division, including about 500 Rough Riders, and eight troops from the First Regular Cavalry, and the Tenth Cavalry (colored). The soldiers immediately

suffered greatly from the extreme heat and from the thick entanglement of brush and vines which impeded their march. Juraguacito was reached by the night of the 23rd, many having fallen exhausted by the way, but the enemy offered no opposition until the invaders came to Las Guasimas three miles beyond Siboney. The troops, having divided, approached by two roads, the Rough Riders taking the left and more mountainous road, and General Wheeler and General Young taking the right or valley road, with the regular troops. For some distance these roads ran nearly parallel, distant from each other about one-half a mile, with a wooded ridge between. Through a gap in this ridge the valley road swept to the left or west, and was met by the left road, the two thus forming one road and leading in a westerly direction towards Sevilla. The vicinity of this gap and the confluence of the two roads was known as Las Guasimas, and was 11 miles from Daiquiri. It was commonly reported that the Rough Riders fell into an ambush, but it was afterwards conclusively shown that this was not true, although the fight had many of the characteristics of an ambush. On the evening previous, both General Young and Colonel Wood had learned through scouts of the Cuban General Castillo, that the Spaniards were waiting behind the bluffs and in the woods about Las Guasimas. About 7:00 in the morning the Spaniards were sighted by the regular troops in the valley road, among the ridges on the hillside to the north and west. At 7:30 fire was opened by the Hotchkiss pieces, upon which there was an answering volley from the machine guns and Mausers of the Spaniards. Sharp-shooters were lurking in the trees all along the line and it was from their fire that the regulars suffered most. The line pushed straight on, and soon, from the report of firing to the left, they knew that the Rough Riders were coming down the mountain road and were engaging the Spaniards on their front and left. By short, fierce rushes the regulars and volunteers charged the enemy, and in about an hour and a half drove him from the field. It was stated that the Spanish losses numbered at least 150; the American loss was 16 killed and 52 wounded. This engagement is sometimes known as the battle of Siboney. On the next day Sevilla was occupied by about 8,000 American and Cuban troops under General Adna R. Chaffee.

The Advance of the Army.—During the week that elapsed from the engagement at Las Guasimas on June 24 to July 1, when the Spaniards were attacked all along their line of defense from Aguadores to El Caney, the forces of Shafter were moving forward amid the greatest difficulties. They suffered both from climatic conditions, and from the lack of transport wagons; but they met with no opposition from the Spaniards. The reports of these marches were at first very confusing, because of the great ignorance of the American officers of the topography of the country, and because of the peculiar nomenclature of the Cuban towns, two towns, for example, sometimes having the same name, one being the name of the port, and the other that of the village three or four miles inland. Besides the difficulties arising from this lack of knowledge, there were the actual physical impediments of the country, which, heavily wooded and covered with creeping vines and shrubs, was broken into precipitous cliffs and gorges. During the day the heat was so intense that the men dispensed with all superfluous wearing apparel, and with many of their rations; it was said that the roads for miles were lined with blankets and cans of provisions. However hot the days may have been, the nights were very chilly, and the blankets which had been so burdensome in the day were now sadly needed. The men also suffered from lack of sufficient rations, since their advance was comparatively rapid and the commissary trains had difficulty in keeping up. The men encountered difficulty because the roads, which from the maps seemed to be fairly broad and accessible highways, turned out to be but little better than bridle and foot-paths, hence much time was spent in the construction of roads and bridges. The distress of the men was increased by the almost daily downpour of rain, which was not only cold, but came in torrents, swelling the mountain streams to small rivers. There was, further, the difficulty occasioned by the barb-wire fences, which the Spaniards had strung in zigzag fashion through the woods and across the paths to the east of the San Juan ridge. It was thought, at first that the wires could be quickly cut down with the nippers with which many of the soldiers were provided. It was found, however, that this was no easy task, as the wires were often elaborately twisted, making cutting very difficult; and the cutting of the wires before the trenches of San Juan and El Caney on the 1st of July, necessitated a slow approach on the part of the Americans, by reason of which many casualties occurred.

On the evening of June 30, the army, numbering about 15,000, was in position along the roads leading to the line of attack at Aguadores, San Juan, and El Caney. General Shafter's plan was, in brief, to storm the fortifications on the west side of the San Juan river near the town of Aguadores with a small force, thus restraining the Spaniards at that place from reinforcing those who were strongly fortified at San Juan. Early in the day El Caney, which it was thought would speedily surrender, was to be taken, and the division, thus victorious, would then reinforce the attacking division at San Juan. The stubborn resistance at El Caney, of course, in part, frus-

trated this plan. The disposition of the army was as follows: the second division, under Brigadier-General H. W. Lawton, U. S. V., was to engage El Caney; the first division, under Brigadier-General J. Ford Kent, U. S. V., and the cavalry division of Major-General Joseph Wheeler, U. S. V., was to take San Juan, while the brigade of Brigadier-General Duffield, U. S. V., was to attack Aguadores. The distance between the extreme left of the army at Aguadores and the extreme right at El Caney, was about 7 miles.

The Fight at El Caney.—On the morning of July 1 the second division, under General Lawton, was disposed about El Caney as follows: on the extreme right, to the north and east of the town, was the Third Brigade, General Chaffee commanding, consisting of the Twelfth, Seventh, and Seventeenth Regulars. The Second Brigade, Colonel Miles commanding, consisting of the Fourth, First and Twenty-fifth Regulars, occupied a position to the east of El Caney on General Chaffee's left. The First Brigade, General Ludlow commanding, consisting of the Eighth and Twenty-second Regulars, and the Second Massachusetts volunteers, together with General Garcia's Cubans, moved still further to the left, and lay on the west of the town. About 2,400 yards to the southeast from the stone fortification on the El Caney ridge, was Captain Allyn Capron's Battery E, First Artillery, consisting of four field pieces, 3.2 calibre. The fortifications at El Caney were such as required an artillery attack, but these four small field pieces were all that the Americans possessed, and had no high degree of efficiency. At about 6:30 in the morning, Capron's Battery opened upon the stone fortification before mentioned; the firing continued for about an hour, eliciting no reply, and doing but little damage. The infantry advance was then begun by Chaffee's Brigade, and was immediately met by a storm of balls from the Spanish Mauser rifles. The advancing lines had little knowledge of the range, and did not succeed in doing great damage; on the other hand, the Spaniards knew the range to every ridge and depression perfectly, and thus the casualties among the Americans were many from the first. Soon the other brigades were beginning the attack, and Chaffee's men feared that they were receiving the fire of Ludlow's Brigade, which, it will be remembered, was opposite, on the extreme left, to the southwest of the town. It was soon discovered, however, that the firing proceeded from a block-house, massed and well fortified, between the advancing lines and the outer trenches of El Caney. Around this were rifle pits, and around all were mazes of barbed wire. The place was stormed with great difficulty, and was not taken until the morning had well advanced, and it was not until this capture that the American lines converged into anything like a regular line of attack about the town. As the men emerged from the scrub forest and bushes into the swale which stretched before the trenches at El Caney, the casualties increased in number, and for a time the Spanish position seemed impregnable, while the Americans were exposed to a galling fire. In fact, for a time advance was impossible, and the Seventh and Seventeenth lay under fire for about six hours. Our men maintained a constant fire, but it seemed to be ineffective; our lines, however, crept forward again, and crossing the swale, began a series of short, quick dashes toward the trenches, which of course was deadly work. At about 2 o'clock, July 1, General Kent, at San Juan, sent to General Lawton asking that he relinquish his efforts to take El Caney, and proceed at once with his division to reinforce the attacking lines at San Juan. This was not complied with, but the Americans kept pressing up the inclines, and soon had swarmed over the outer trenches, and were pursuing the Spaniards toward the rifle pits on the top of the ridge. At about 3 o'clock the summit was gained, and all the trenches, together with the stone fortification, were abandoned, the Spaniards fleeing toward the village, and some stopping at block houses on the way. During the pursuit and capture of these, shots were still exchanged, but by 4 o'clock, the town, as well as its intrenchments, was won. The rifle pits and block houses were found to be full of the Spanish dead and dying, and the Spanish prisoners taken were immediately set to work at digging trenches for the dead bodies. It will be remembered that the American forces had been harassed all day by the long-distance Mauser rifles, and hence the American dead and wounded were lying in the scrub around El Caney, sometimes at places more than a mile distant from the intrenchments. Throughout the night search parties were bringing in these bodies, and stragglers who had become separated from their own companies, joined their fellows. It was said that the Spaniards numbered about 1,000, and the Americans about 4,000. The latter lost nearly 450 killed and wounded, while the Spaniards lost nearly half their number in killed, wounded, and prisoners. Among the Spaniards killed was General Vara del Rey, his brother, and two of his sons. Both forces showed great bravery and determination, and among the Americans the advance was marked by many individual cases of daring and heroism.

The Fight at San Juan.—About two miles west of the hill El Pozo, and on the main road leading from Siboney to Santiago, is the San Juan hill, which was the most strongly fortified position of the Spanish lines. About one-third of a mile east of the hill was a belt of woods a mile and a half deep; between these woods and the

first terraces of the hill lay a strip of meadow land, broken on the right by a pond or lagoon, and in the middle and on the left by knolls or small hills. At the top of the first main rise in the San Juan hill, stood a hacienda, or Spanish farm house, and on each side of this there were lines of trenches and rifle pits. Behind the hacienda was a dip in the hill, and then a rise, upon which was a strongly fortified block house, with trenches extending both to the left and right; still further up the hill, and marking its summit, was another block house with trenches and rifle pits similarly placed. Around the hacienda and both of the block houses, before the trenches, and across the meadow land were stretched lines of barbed wire, which throughout the campaign proved to be such a great impediment to the advancing forces. Coming from the north and following a most devious course, the small stream called the San Juan river flowed through the meadow land. The road leading up from Siboney opened into meadow land at the river east of the hacienda.

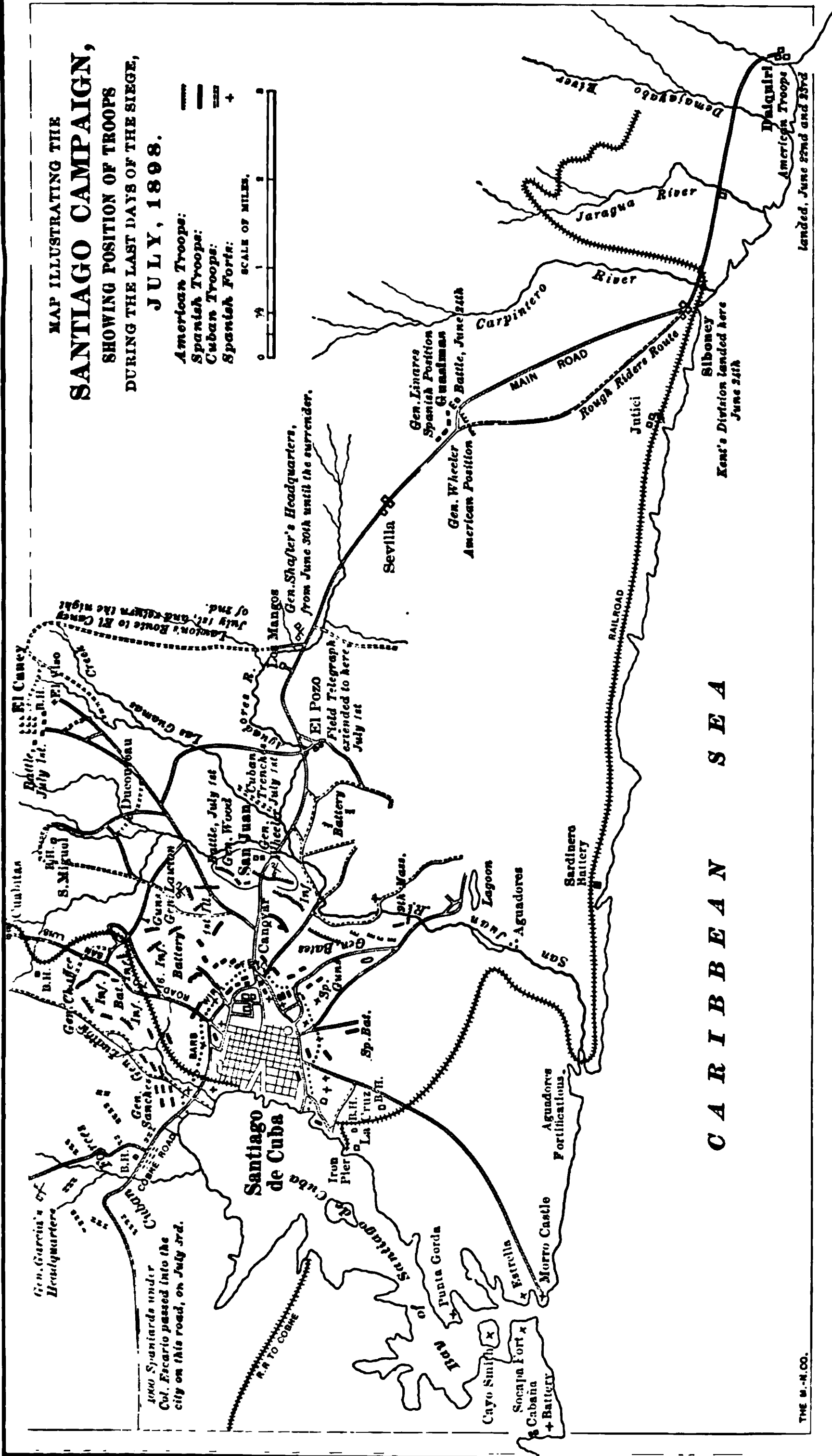
The first division of Shafter's army, commanded by Brigadier-General J. Ford Kent, was made up as follows: The first brigade, Brigadier-General H. S. Hawkins commanding, consisted of the Sixth and Sixteenth Regulars, and the Seventy-first New York; the Second Brigade, General Pearson commanding, consisted of the Tenth, Second and Twenty-first, all Regulars; and the Third Brigade, Colonel C. A. Wikoff, U. S. A., commanding, was composed of the Ninth, the Thirteenth and the Twenty-fourth, all Regulars. Besides these, General Kent was assisted by General Wheeler's dismounted cavalry division, consisting of the First, Ninth and Tenth Regulars, and the First Regular Volunteer Cavalry, known as the Rough Riders. The only artillery was the Battery of Captain Grimes, posted on El Pozo hill, which position overlooked the belt of woods and meadow land previously described. Late in the afternoon of June 30, the army, which was encamped along the main road to the west of Sevilla, received orders from General Shafter to break camp and proceed towards San Juan. The entire force seems to have received the same order at about the same time, for all the troops immediately struck into the road, which being narrow, caused much crowding and confusion. That night the men bivouacked along the road and in the morning proceeded toward the belt of woods. Much blame has been put upon General Shafter because neither he nor, it was stated, any of his subordinate officers had reconnoitered this road or the woods; and it was during this march that a great number of casualties occurred among the American troops on account of the Spanish sharp-shooters.

Two main mistakes seem to have been made in planning the capture of San Juan hill. In the first place, it is stated, the attempt should not have been made without greater artillery force; military critics say that a position so strongly fortified as was San Juan, should not be assaulted without a previous reduction of the defenses by artillery. And furthermore, the infantry attack should be on the flank, whereas, in the case of San Juan, it was a march straight up in front of the trenches. The second mistake which seems to have been made was the way in which the troops were sent from the woods into the meadow land. Two or three days before the battle General Chaffee pointed out that if the troops were led down a narrow trail into the meadow, and were not until then deployed to right and left, the whole fire of the enemy would be directed upon the narrow line as it emerged from the woods, and that the loss would be very great; he suggested that numerous trails leading from the main road be cut through the woods so that the entire force could enter the meadow in a very short time. This plan, however, was not adopted.

The battle was begun by Grimes's Battery at 6:40 A. M., July 1. Like the battery at El Caney this artillery did little in effecting the capture of the trenches. Both battles were such as demanded a strong artillery assault and both were won by the determined attacks of infantry. At about the time of the opening of Grimes's fire, the advance troops (Hawkins's Brigade) began to ford the San Juan river about 250 yards to the right of El Pozo, and it was from here on that the terrible work of the unseen sharp-shooters and guerrillas, hidden in the trees, was most keenly felt. These men were entirely unseen, and fired not only on the advancing soldiers, but a little later in the day, when the shots from the rifle pits had killed and wounded many of our men, they shot down both the surgeons and the Red Cross agents and also fired upon the wounded. Instructions were finally given to two colored companies, to scout the woods and the scrub-land round about for these sharp-shooters, and not to bring in any prisoners, the meaning of course being that all such guerrilla fighters should be killed. The negroes were gone a long time, and, as the firing from the bush considerably diminished, it is likely that many a sharp-shooter was left dead in the tree to which he had been tied. During this time the narrow trail was becoming more and more congested with troops, General Wheeler's cavalry came up with General Hawkins's men and the two brigades filed along side by side; after a time the confusion became so great that little order was observed, and company and regimental classifications were to some extent lost. An experiment was now made which, while resulting in some benefit, was very disastrous to our forces. A large balloon was sent up directly above the road in order to discover more exactly the position of the

DURING THE LAST DAYS OF THE SIEGE,

American Troops:
Spanish Troops:
Cuban Troops:
Spanish Forts:



THE M.-M. CO.

enemy, and to find out any additional trails that might be in the woods. Another road was discovered, leading to the left from the main road, and after passing over a hill, entering the meadow land at some distance south of the main trail. This was recognized as an avenue of relief, and troops were immediately dispatched upon it. The disaster that arose on account of the balloon, came from the fact that by it the Spaniards learned that our troops were marching along the main trail, and were entering the belt of woods. This immediately drew not only the fire of the riflemen in the trenches, but also that of the artillery; the Spaniards, of course, knew the exact location of the trail, and so our men were subjected to a fierce fire, both of Mauser balls and of shrapnel. The Spaniards also supposed that the second, or left road, had been discovered in the balloon ascension, and that, therefore, troops were advancing along it. Accordingly they directed a fire upon this road also. The first regiment to be sent on this left road was the Seventy-first New York Volunteers. Military critics have stated that it was very ill-advised to send an inexperienced volunteer regiment, unsupported by regulars and alone, into a position of such extraordinary danger. The first battalion leading received the concentrated Spanish fire and fell back in confusion on the rear. The men were ordered to lie down, and presently the second and third battalions came up and the regiment then proceeded along the trail in spite of the Spanish fire.

At about twenty minutes after twelve the Third Brigade, Colonel Wikoff commanding, reached the point near the first ford of the San Juan river, where the left trail branched off; they pushed up the trail and passed the volunteers. Following the Second Brigade came the Third, General Pearson commanding; of this brigade the Tenth and Second Regiments took the left road and the Twenty-first the right. It may be seen now that Kent's division was disposed along the roads as follows: up the branch road had gone from the First Brigade, the Seventy-first New York; from the Third Brigade, the Ninth, Thirteenth and Twenty-fourth Regulars; following them from the Second Brigade, the Second and Tenth Regulars. Up the main road had gone Wheeler's Cavalry Division, consisting of the First, Tenth and Ninth Regulars and the Rough Riders; from the First Brigade, the Sixteenth and Sixth Regulars; and from the Second Brigade the Twenty-first Regulars.

When Colonel Wikoff with the Third Brigade and the Seventy-first New York reached the meadow land he was forced to cross the San Juan stream, deploy his troops, and advance as best he could in the face of the Spanish fire. By a series of dashes the men advanced through the water and the tall grass, many falling on every side. There was no brigade formation, the advance being rarely by regiment, but by companies. In the ten minutes which elapsed while the men were leaving the woods, the command descended from Colonel Wikoff, who was killed in the charge, to Lieutenant-Colonel Worth of the Thirteenth, who was immediately severely wounded; Lieutenant-Colonel Liscum, of the Twenty-fourth, assumed command, but he also fell and was succeeded by Lieutenant-Colonel E. P. Ewers, of the Ninth.

During this time the crowding and confusion in the main road had increased, and the distress was greater because of the orders received. Orders were issued, contradicted, and reaffirmed in a most rapid and confusing manner. And the result was that the men practically lay still, suffering the fire of the Spanish sharpshooters and the shrapnel from the artillery. It is acknowledged on every hand that the Brigade and Regimental commanders saved the day at San Juan, for the orders from headquarters were such that little could have been effected toward taking the place. Immediately after the Third Brigade with the volunteer regiment issued from the woods, the Second Brigade, consisting now of the Sixteenth and the Sixth, broke into the meadow land under the lead of General Hawkins. About the same time the Twenty-first Regiment of the Second Brigade emerged from the main road and the Tenth and Second of the same Brigade, which had followed Wikoff's men, entered the meadow from the left trail. The fact is worthy of mention that these last two regiments were the only ones which moved upon the trenches in regimental formation. At about half past one, the leaders reached the first crest of the hill; it could not be ascertained exactly which troops were first in the race, but the Sixth and the Sixteenth on the right, and the Ninth, Thirteenth and Twenty-fourth with the New York Regiment on the left, seemed to have reached the crest of the hill at about the same time. On the right the men were led chiefly by Generals Hawkins and Wheeler and Colonel Theodore Roosevelt. The latter, at the head of his men and the Twenty-fourth (colored), with great loss, took the blockhouse on the right; and having formed behind the hacienda rushed on again toward the trenches, the first line of which was taken after a desperate struggle, amid many casualties on the American side and terrible losses among the Spaniards. The fact that the first line was gained, however, did not insure victory; there were other lines of trenches and other blockhouses, and the taking of these meant the loss of many more men, hundreds of whom already were lying dead or wounded in the meadow. It was quickly decided, however, to storm the lines by a series of sharp rushes; this was done and

at about three fifty, the Spaniards had abandoned their last intrenchments and were fleeing to their lines outside of Santiago. In about an hour the firing died away, and it is likely that had the men not been utterly exhausted, they could have pushed on and with reinforcements of Lawton's men from El Caney, could have invested Santiago that same night. Further efforts, however, were impossible. It had been a hard fight and like El Caney, had been won by deeds of individual bravery. The Division lost 12 officers and 77 men killed, and 32 officers and 463 men wounded.

At about five o'clock the next morning (Saturday, July 2) the Spaniards made desperate efforts to recover San Juan hill, but the tables were turned, our men being now behind the intrenchments. Consequently the enemy was repulsed with great loss, the dynamite gun of the Rough Riders, and the Hotchkiss guns, which had been posted near the hacienda, doing very effective work. The assaults continued throughout the day, culminating at nine thirty in the evening, when the desperation of the Spaniards carried many of them within 100 yards of the American line. They were repulsed, but the next morning, after a small amount of long distance firing, they approached our lines with a flag of truce. The casualties of the second day on our side consisted of nine men killed and four officers and ninety men wounded, and of the third day one man killed and eight wounded. The losses for the three days' fight were as follows: at San Juan, 12 officers and 87 men killed, 36 officers and 561 men wounded and 62 men missing; at El Caney, 11 officers and 121 men killed, 44 officers and 642 men wounded, and 19 men missing—making a total loss of 1,595. The missing, however, with few exceptions, reported later. The Spanish loss has not been definitely recorded; the killed, wounded and prisoners at El Caney and San Juan have been roughly estimated at half the numbers engaged.

The Failure at Aguadores.—The effort of Brigadier-General Duffield on July 1 to engage the fortifications near Aguadores and thus prevent a Spanish detachment from reinforcing the lines at San Juan, was not successful. The plan was for the *New York* and *Suwanee* to shell the town and at the same time for Duffield to lead an attack with the Thirty-third Michigan, a Battalion of the Thirty-fourth Michigan and the Ninth Massachusetts. Although the bombardment from the ships was apparently effective, this force did not succeed in reaching Aguadores, a portion of the railroad trestle across the San Juan river having been destroyed. Fire was opened on the force from the fort and two men of the Thirty-third were killed, and about fifteen men were wounded. Reply was made by General Duffield, but believing that nothing could be effected, he retired toward Siboney.

After the Battles Before Santiago.—The unsuccessful attempt of General Duffield, the stubborn resistance of the Spaniards at El Caney and San Juan, and the great losses of the Americans, combined to depress General Shafter, who was already suffering from fever, and who for several days had been in a weak condition. On Saturday, at a council of war, he proposed to withdraw the American army to a point near Siboney, and there await the arrival of heavy artillery. At the same time he decided to advance the American lines as far to the northward as possible, and thus cut off the reinforcements that the Spaniards expected from General Pando. Strangely Shafter also decided to demand a surrender of the city. In his proposal to retire he was seconded by Generals Kent and Sumner, but was opposed by Generals Wheeler, Lawton, and Bates. As is well known, the retreat was not made, but the Americans held the trenches until the capitulation of the city. On Sunday, July 3, the day on which Cervera left the harbor, Shafter sent three dispatches to the War Department which show both his depression and the change in the aspect of affairs that came in a few hours. The three dispatches are as follows:

Playa del Este, July 3. To Secretary of War, Washington. Camp near Sevilla, Cuba, July 3. We have the town well invested on the north and east, but with a very thin line. Upon approaching it we find it of such a character and the defenses so strong it will be impossible to carry it by storm with my present force.

"Our losses up to date will aggregate a thousand, but the list has not yet been made. There is but little sickness outside of exhaustion from intense heat and exertion of the battle of the day before yesterday, and the almost constant fire which is kept up on the trenches. "Shafter, Major-General."

"Playa del Este, July 3. To Secretary of War, Washington. Camp near Sevilla, Cuba, July 3. I sent a demand for the immediate surrender of Santiago, threatening to bombard the city. I believe the place will be surrendered. The following is my demand for the surrender of Santiago:

"'Commanding General Spanish forces, Santiago de Cuba, July 3.

"'I shall be obliged, unless you surrender, to shell Santiago de Cuba. Please inform the citizens of foreign countries and all women and children that they should leave the city before ten o'clock to-morrow morning.'

"Very respectfully, Shafter,
"Major-General Commanding."



THE "VIZCAYA" AS SHE LAY STRANDED AFTER THE DESTRUCTION OF CERVERA'S SQUADRON.

"Headquarters Fifth Army Corps,

"Cuba, July 3.

"The Spanish fleet left the harbor this morning and is reported practically destroyed. I demanded the surrender of the city at ten o'clock to-day. At this hour, four-thirty P. M., no reply has been received. Perfect quiet along the line. The situation has been precarious on account of the difficulties of supplying the command with food and the tremendous fighting capabilities shown by the enemy, who has almost an impregnable position. "Shafter, Commanding."

The days following July 3, which marked the last of the fighting before Santiago and also the destruction of Cervera's squadron, were full of suffering for both the Spanish and the American troops. During this time the American lines were advanced far to the right so that our trenches overlooked Santiago on three sides and denied all hope of escape to Toral's army. Our trenches also were deepened and strengthened and orders were given for bringing up new artillery. As might be expected, the reaction which came after the three days' fighting was great and weakness and depression were seen in most of our troops. On account of the tropical rain storms the trenches were little better than ditches which for a large part of the time were half full of mud and water. In these our men were obliged to lie, suffering at the same time from the intense heat of the sun. It was not strange, therefore, that a malarial fever broke out among the troops and in a day or two reports came of cases of a mild form of yellow fever. Thousands of refugees had left the city for El Caney, and were also encamped along the roads as far as Siboney. These persons were permitted to enter our camps, and it is thought that from them and the pest house in Siboney yellow fever originated. Much blame was attached to General Shafter and the officers immediately under him for permitting this freedom and for laxity in bringing up supplies. Food, medicine, and surgical attendance were insufficient, and the roads for miles about were lined with wounded men seeking assistance. Not until it was too late was the fever-infected village of Siboney burned. For days the only food offered both to the troopers and to their wounded comrades, was bacon, hard tack, and coffee.

Destruction of Cervera's Fleet.—In the meantime, on Sunday, July 3, the magnificent squadron of Admiral Cervera had been destroyed. It seems that in the wonderful exploit of Lieutenant Hobson, the *Merrimac's* rudder was shot away and so she was not swung directly across the channel. The wreck, however, prevented Cervera from making the attempt at night. On the morning of the third, the *Brooklyn*, Captain Cook commanding, lay to the west of the harbor entrance, and the *New York*, Captain Chadwick commanding, about seven miles to the east, Admiral Sampson having intended to hold a conference with General Shafter near Siboney. Between these two cruisers lay the battle-ships; next to the *Brooklyn* came the *Texas*, 6,315 tons, Captain Philip, then the *Iowa*, 11,340, Captain Evans, the *Oregon*, 10,288, Captain Clark, and the *Indiana*, 10,288, Captain Taylor. They lay from 4,000 to 6,000 yards off shore. The *Massachusetts* was coaling at Guantanamo, the *Indiana* was too far to the eastward to be of much real service in the engagement, and the *New York* was practically not in the fight at all, though the full fire of the Morro batteries was directed upon her as she passed. Shortly after nine o'clock smoke was seen rising behind La Socapa, and soon after the fleet issued from the harbor, turning west, in the following order: *Infanta Maria Teresa*, 7,000 tons, Captain Victor M. Concas commanding; *Viscaya*, 7,000, Captain Antonio Eulate; *Cristobal Colon*, 6,840, Captain Emilio Diaz Moreu; *Almirante Oquendo*, 7,000, Captain Juan B. Lazaga; the monitors *Pluton* and *Furor*. The ships came rapidly out of the harbor; about twelve minutes elapsed from the time when the first cruiser was seen until the second monitor was out of the channel. The cruisers immediately opened fire on the blockading squadron which began to close in as rapidly as possible. The converted yacht *Gloucester*, Captain Wainwright commanding, behaved with the utmost daring, taking as its special work the engagement of the formidable *Pluton* and *Furor*, both of which were sunk about twenty minutes after leaving the harbor. Shots from the *Iowa*, *Indiana*, and *Texas* hastened this destruction. The *Brooklyn*, having first place in the race, maintained her lead, and the *Oregon* with remarkable speed passed the *Iowa* and the *Texas*, thus being the first of the battle-ships. It was these two leading ships that chiefly engaged and destroyed the *Maria Teresa* and *Viscaya*; the *Colon* was steaming ahead more successfully, and the *Oquendo* was left to the *Texas* and *Iowa*. One of the first shots had cut the fire-main of the *Maria Teresa*, starting a fire which could not be extinguished; this vessel and the *Oquendo*, unable longer to endure the terrific and well-directed fire, ran on the beach, the one at Mina Mina, six and one-half miles west of Santiago, at about 10:30, and the other about fifteen minutes later at Juan Gonzales half a mile farther west. The *Viscaya*, still sustaining the fire of the leading vessels, steamed ahead until she reached Aserradero, fifteen miles from Santiago, where she was beached at 11:15, burning fiercely and her reserve ammunition on deck beginning to explode. Before this time the *Indiana* had

been signalled to return to the harbor entrance and the *Iowa* to "resume blockading station." The latter vessel with the monitor *Ericsson* and the *Hist* rescued as many of the crew of the *Vizcaya* as was possible; the auxiliary cruiser *Harvard* and the *Gloucester* performed the same service for the *Maria Teresa* and the *Oquendo*. The *Colon* with a remarkable burst of speed drew beyond the shots of our leading vessels, but at 12:50 the *Brooklyn* and the *Oregon* succeeded in getting her range, and when at 1:20 the latter vessel threw a shell beyond her bows she ran ashore at Rio Torquino forty-eight miles from Santiago. The surrender was made to Captain Cook. Admiral Sampson, who had come up in the *New York*, placed the wreck in charge of the *Oregon*, and had the prisoners transferred to the *Resolute*, which vessel together with the *Vixen* and the *Texas* had come in at the finish. The credit for this victory is in no small degree due to Rear Admiral Sampson, who, though not present until the close, had maintained the successful blockade and had planned the engagement in case Cervera should leave the harbor.

The cannonading in this engagement was perhaps the fiercest and most effective in the history of naval warfare. Our vessels exposed both to some of the shore batteries and to all of the enemy's vessels suffered but slightly, the greatest damage being aboard the *Iowa*, though the *Brooklyn* was struck the most frequently. Of the Spanish ships the *Colon* suffered least from our fire, and the fact that she sank was probably due to the opening of her sea-valves, which it is supposed was treacherously done after the ship's surrender. The destruction, suffering, and loss of life on the other ships was appalling. Again and again the Spanish gunners were driven from their posts by the raking fire of shot and shell from the American ships. Many of the men who were not killed by the flying missiles were burned or scalded to death or drowned. The conduct of the American officers and seamen in saving their defeated enemies was brave in the extreme, the fires and exploding magazines in the cruisers making the work of rescue very dangerous. Admiral Cervera and about 1,774 officers and men were captured and about 510 Spaniards killed or wounded. The Americans protected the prisoners from the Cubans, fed and clothed them, gave them medical attendance, and buried their dead with the honors of war. The prisoners were taken north to Annapolis and Portsmouth. Before his flight from Santiago harbor, Admiral Cervera clearly saw the danger and almost certain destruction that awaited him, and the move seemed incongruous with his good sense and humanitarian feelings. The reason he gave was that he preferred to lose his ships in a fair fight on the open sea than in a land-locked harbor. But the pitiful report was commonly credited that Cervera's squadron was ordered both to enter Santiago harbor and to leave it by government authority. The terrible affair may have been the result of unwise and unscrupulous political manoeuvres.

The Surrender of Santiago.—Before the escape of Admiral Cervera from Santiago harbor on the morning of the third, General Shafter demanded the surrender of the city on pain of bombardment in case of refusal. In his reply General Toral said: "It is my duty to say to you that this city will not surrender, and that I will inform the foreign consuls and inhabitants of the contents of your message." At the request of the consuls Shafter postponed the bombardment until 10 o'clock on the morning of the 5th in order that the non-combatants, which numbered upwards of 20,000, might leave the town. The report of the destruction of Cervera's squadron brought great joy to the American line, and the announcement of it, by Shafter to the Spanish generals, seems certainly to have been a *coup de maître*, for it increased the already great depression of the Spaniards. Even under these conditions, however, Toral kept up the game of delay which, while exasperating to the American commander, pointed nevertheless to ultimate capitulation. His plea was that he could not surrender without advices from General Blanco and the Madrid government. Through the courtesy of General Shafter, he was permitted to use the American wires and was given until noon of July 9 in which to complete his negotiations and to surrender. When this day came Toral attempted further delay and offered to evacuate the city on condition that his troops be allowed to retire to Holguin. This of course was refused, but Shafter agreed to further negotiations in which both the governments at Washington and Madrid took part. As matters were not being hastened, a bombardment began on the morning of July 11, and, though much damage was done, there was little loss of life, and it has been thought that on the whole it was ineffective. Sampson's fleet took part in the bombardment, but many of the shells failed to reach the city. On account of the mines in the harbor channel the Admiral declined to enter and shell the city at short range. At about mid-day a committee from General Toral approached our line with a flag of truce, whereupon a conference was arranged to be held on July 14 at noon, between General Toral and Generals Shafter, Wheeler, and Nelson A. Miles. The latter had reached the American lines on the 11th, just after the bombardment.

The Spanish commissioners appointed by General Toral, consisting of General Escario, Lieutenant-Colonel Fortan, and the British Vice-Consul Albert Mason, met on the day appointed Generals Wheeler and Ewers and Captain Miley, the commis-



THE "ALMIRANTE OQUENDO."
Showing her condition after the battle.

sioners named by General Shafter. As usual, the Spaniards were evasive and dilatory, and it was not until after midnight that they were forced to sign thirteen articles of capitulation; and these they insisted were only tentative and could not be regarded as permanently binding until they received proper authorization from General Blanco. But on the following day General Shafter received from General Toral a letter of capitulation, and the time of surrender was placed at nine o'clock on the following morning, July 17. The following terms of capitulation were agreed upon: "(1) Twenty thousand refugees to go back to Santiago; (2) an American infantry patrol on roads surrounding the city; (3) our hospital corps to give attention to sick and wounded Spanish soldiers; (4) all Spanish troops in the province of Santiago except the 10,000 at Holguin under command of General Luque to come to the city to surrender; (5) the guns and defenses of Santiago to be turned over to the Americans in good condition; (6) the Americans to have full use of the Juragua Railroad; (7) Spanish troops to surrender their arms; (8) all Spaniards to be conveyed to Spain and to take portable property; Spaniards to coöperate with Americans in destroying harbor mines." The territory surrendered included "all of eastern Cuba from Acerraderos on the south to Sagua la Tamana on the north, via Palma, with practically the Fourth Army Corps." This territory contains about 4,000 square miles, or one-tenth of the entire island. On the 17th at the hour agreed upon the leaders of the opposing forces, attended by their staffs and escorted by troops, met without the city, whereupon Toral formally surrendered his sword to the American General, which, however, Shafter courteously returned, and both men at the head of their troops, entered the city. At twelve o'clock the red and yellow Spanish flag was hauled down and the American banner was unfurled amid the cheering of troops, the booming of cannon and the strains of the "Star Spangled Banner."

General Shafter telegraphed to Washington as follows: "I have the honor to announce that the American flag has been this instant, 12 noon, hoisted over the house of the civil government in the city of Santiago. An immense concourse of people was present, a squadron of cavalry, a regiment of infantry presenting arms, and a band playing national airs. A light battery fired a salute of twenty-one guns.

"Perfect order is being maintained by the municipal government. The distress is very great, but there is little sickness in town and scarcely any yellow fever.

"A small gunboat and about 200 seamen left by Cervera have surrendered to me. Obstructions are being removed from the mouth of the harbor.

"Upon coming into the city I discovered a perfect entanglement of defenses. Fighting as the Spaniards did the first day, it would have cost five thousand lives to have taken it.

"Battalions of Spanish troops have been depositing arms since daylight in the armory, over which I have a guard. General Toral formally surrendered the plaza at 9 A. M."

President McKinley ordered that the people, when performing their own duties, be protected in their personal property, and religious rights, and that municipal law, so far as might be compatible with the new régime, be continued by the civil authorities under supervision of the Americans, until suspended.

The victory thus finally achieved cost an immense amount of suffering and a great many American lives. The Spaniards who had proved brave and desperate foes, about equalled the attacking Americans in number and were stationed behind strong defenses. Difficulty was experienced both in landing supplies and in transporting them to the camps and line of battle; yet it seems that the American soldiers, even before the fall of Santiago, should have been better cared for. It must be said, however, that the commissaries were obliged in the interests of humanity to feed 20,000 refugees besides the soldiers. In the popular approval accorded the American soldiers the volunteers did not receive a word of praise beyond their due; their bravery and vigor was unquestioned; but it was the regulars who really won Santiago; years of discipline had given them a steadiness which the volunteers lacked. They did not at the time receive from the public due recognition or praise, but when all the facts were known, their services were better appreciated.

After the Surrender.—The Americans experienced little difficulty in carrying the terms of surrender into effect. On the 18th of July Lieutenant Hobson exploded the mines in the harbor entrance and Commodore Schley entered with his squadron. About this time some unpleasantness developed between General Garcia and General Shafter because the latter had permitted the Cubans to take no part in the occupation of Santiago upon its surrender. A few days later the Cuban General withdrew his troops from the outskirts of the city. General Leonard Wood, who had been colonel of the cavalry regiment of which Theodore Roosevelt was the lieutenant-colonel, was appointed military governor of Santiago, and his subsequent work in administration and in the renovation of the dirty city was a model of efficiency. On July 21 Admiral Sampson bombarded the port of Nipe on the northern coast of Santiago province and destroyed the Spanish cruiser *Jorge Juan*, and on the 25th Com-

mander Todd with the gunboat *Wainwright* and six small vessels reduced the Spanish war shipping in the harbor of Manzanillo. By the 26th, 20,000 Spaniards in the province had surrendered and on the following day those at Caimanera, who had shown some defiance, laid down their arms.

Admiral Camara's Fleet.—During the latter part of June and up to the middle of July, the movements of Admiral Camara's Cadiz fleet were very mysterious, and Commodore John C. Watson was in constant readiness to make for the coast of Spain in case it became clear that the Admiral intended sailing to Manila. It was finally seen that the movements of the fleet were only a ruse, but in the meantime Commodore Watson repeatedly received orders to sail, which orders were as often countermanded. On June 27, when commanding two battle-ships and three cruisers, with the flagship *Newark*, he was ordered to attack the Spanish coast, as Admiral Camara was proceeding east in the Mediterranean. Although the admiral was unable to get a sufficient amount of coal at Port Said, his larger ships entered the canal July 5, but four days later they returned to the Port on their way back to Spain, the government having paid about \$280,000 in tolls. Thus ended one of the apparently most foolish movements of the war. Commodore Watson remained on blockade duty. The blockade of both Cuba and Porto Rico, as well as that of Manila, was effectively maintained until after the signing of the protocol August 12.

The Campaign in Porto Rico.—Upon the fall of Santiago preparations for the invasion of Porto Rico were completed as soon as possible. On July 21 General Miles, Commander-in-Chief of the Army, who had been with the American forces at Santiago since the 11th, sailed for Porto Rico from Guantanamo bay with about 3,400 men convoyed by the *Massachusetts*, *Cincinnati*, *Yale*, *Columbia*, *Dixie*, *Gloucester*, *Annapolis*, *Leyden*, and *Wasp*, and two days later five transport ships carrying the brigade of Brigadier General Theodore Schwan, U. S. V., sailed from Tampa. It was decided to send a stronger force into Porto Rico than had been used at Santiago; therefore on the 28th reinforcements for General Miles sailed from Newport News under the command of Major-General John R. Brooke, U. S. A. It was expected that about 30,000 men would be sent to the island, but it was afterward found this number was not needed. After a slight skirmish between a small force of Spaniards and the crew of the *Gloucester*, General Miles's expedition was disembarked at Guanica fifteen miles west of Ponce on the southern coast, the force consisting of "four light batteries of the Third and Fourth Artillery, Battery B of the Fifth Artillery, the Sixth Illinois Infantry, the Sixth Massachusetts, 275 recruits from the Fifth Corps, 60 men of the Signal Corps, and the Seventh Hospital Corps." The expedition proceeded inland, meeting with scarcely any resistance, a small skirmish occurring at Yauco. The *Dixie*, *Annapolis*, *Gloucester*, and *Wasp* were sent by Captain Higginson to blockade Ponce, the authorities of which fearing bombardment, hastened to surrender (July 28). The same day General Miles issued a proclamation, insuring to the people public security and property rights and suggesting the destiny of the island as a part of the United States. The great majority of the people were well disposed toward the invading army and within two days after the landing 2,000 natives offered their services; meanwhile a large part of the Spanish soldiery was steadily falling back toward San Juan, the capital and principal city of the island, the fortifications of which, it will be remembered, Admiral Sampson had bombarded on May 12. The port Arroyo was taken by the ships, and the invasion, under General Miles's command, was conducted in three divisions. General Schwan with regulars proceeded west from Guanica to San German and then north to Aguadilla, his objective point being Arecibo on the northern coast. Brigadier-General Roy Stone, U. S. V., preceded by Brigadier-General Guy V. Henry, U. S. V., with a small force took a more direct route north, intending to effect a junction with General Schwan at Arecibo. Under General Brooke's direction Major-General James H. Wilson, U. S. V., and Brigadier-General Oswald H. Ernst, U. S. V., undertook expeditions by way of Cayey to San Juan. General Brooke himself accompanied the Wilson expedition; General Miles, of course, had general supervision and command of all the movements. None of these were completely effected before hostilities ceased by reason of the protocol, August 12. In this campaign of nineteen days, the Spaniards either made no show of force, retreating before the American advance, or stood just long enough to cause a skirmish. There were only five encounters and none of them rose to the dignity of a battle. It is likely that, had not the protocol intervened, not only San Juan, but the administration of the entire island would have been easily secured by the Americans. For this signal success much credit was justly given to the plans and superior generalship of General Miles.

The Protocol.—By the latter part of July the Spanish government, largely from the advice and protestations of Spanish merchants, began to realize its hopeless situation. Both on the ground of humanity and of business it was imperative from the Spanish point of view that hostilities cease. On July 26 Spain opened peace negotiations through M. Jules Cambon, the French Ambassador at Washington, and after long and careful consideration with his cabinet, President McKinley transmitted to



MAJOR-GENERAL NELSON A. MILES, U.S.A.
Commanding the Army.

Madrid through M. Cambon the terms upon which peace would be accepted. On August 3, M. Cambon intimated that Spain would practically accept the proposal (the only objections being to some minor points, such as phraseology), which the Spanish cabinet did three days later. On the 10th, a protocol formally suspending hostilities was drawn up in Washington, and on the 12th was signed by Secretary Day and M. Cambon. The following are the six important points of the document which were made public:

- "1. That Spain will relinquish all claim of sovereignty over and title to Cuba.
- "2. That Porto Rico and other Spanish islands in the West Indies, and an island in the Ladrones, to be selected by the United States, shall be ceded to the latter.
- "3. That the United States will occupy and hold the city, bay, and harbor of Manila pending the conclusion of a treaty of peace which shall determine the control, disposition, and government of the Philippines.
- "4. That Cuba, Porto Rico, and other Spanish islands in the West Indies, shall be immediately evacuated, and that commissioners, to be appointed within ten days, shall, within thirty days of the signing of the protocol, meet at Havana and San Juan, respectively, to arrange and execute the details of the evacuation.
- "5. That the United States and Spain will each appoint not more than five commissioners to negotiate and conclude a treaty of peace. The commissioners are to meet at Paris not later than October 1.
- "6. On the signing of the protocol hostilities will be suspended, and notice to that effect will be given as soon as possible by each government to the commanders of its military and naval forces." For text of treaty, see UNITED STATES.

The War Department immediately telegraphed orders for a cessation of hostilities, to General Shafter in Santiago de Cuba, General Miles in Porto Rico, and General Merritt in the Philippines, and the Navy Department sent instructions to Admiral Sampson, Admiral Dewey, Commodore Watson, and Commodore Howell, to raise the blockades of Cuba, the Philippines, and Porto Rico.

The Surrender of Manila.—Major-General Wesley Merritt, U. S. A., it will be remembered, sailed for Manila on June 29 to assume the position of military governor; he reached Cavité July 25. During this time reinforcements were being sent to the Americans in the Philippines, and Admiral Dewey was using great tact and executive ability. Admiral Diedrichs, a German officer, had come to Manila with his squadron and did not evince great cordiality toward the American fleet. In the early part of July the insurgents were preparing to take Isla Grande commanding the entrance of Subig bay, Luzon, about forty-five miles north-east of Manila, their object being to attack and capture the town of Subig. Germany had not recognized the belligerency of the insurgents, and so Admiral Diedrichs claimed the right and, in the interests of humanity, the duty of protecting the Spanish residents in Subig. The situation was very unpleasant for Admiral Dewey, but he immediately detailed the *Concord* and *Raleigh* to take possession of Isla Grande. The Spaniards surrendered without firing a shot and the Germans withdrew, not being able to make any objections since Germany had recognized a state of war between Spain and the United States. The prisoners were turned over to the insurgents, who treated them with perfect humanity. The fourth Manila expedition, consisting of the transports *Peru* and *City of Pueblo*, with 1,700 troops under command of Brigadier-General H. G. Otis, sailed from San Francisco July 15. On the 16th and 17th the second Manila expedition arrived at Cavité, and General Merritt arrived on the 25th. Four days later American troops advanced, toward Manila, from Cavité to Malate, and near this latter place were attacked on the 31st by Spanish troops. The Spanish loss was very heavy; the Americans lost 9 killed and about 50 wounded. The same day General MacArthur's reinforcements reached Cavité. On August 7 Admiral Dewey and General Merritt demanded the surrender of Manila, but were refused. Six days later, August 13, the day after the protocol was signed, but long before the news reached the Philippines, the Admiral and General again demanded immediate surrender, threatening bombardment. The Spaniards giving no heed to the demand, the bombardment began at 9:30 Saturday morning and continued for nearly two hours, Admiral Dewey exercising great care to shell only the military defenses. The Spaniards attempted very little reply to the fire from the fleet, but directed their efforts in attempting to repulse the spirited attack of the army on their lines, which was being made simultaneously with the bombardment. After some sharp fighting the Spaniards gave way and surrendered the city. During the afternoon the American flag was raised and the Spaniards gave up their arms. This victory was won after inflicting comparatively heavy losses on the enemy; the American navy sustained no injury in the engagement and the army lost 12 killed and about 40 wounded. The city was surrendered by General Jaudenes, to whom Captain-General Augusti had turned over his command. Through the assistance of the German admiral, Augusti had effected his escape on the *Kaiserin Augusta*. This act of the admiral was looked upon as a culmination of a series of discourtesies toward the Americans in Philippine waters. See also PHILIPPINES and UNITED STATES.

Casualties.—The following statement giving the losses sustained by the American army from April 21 to August 13, 1898, is taken from Secretary Alger's report:

WHERE.	KILLED.		WOUNDED.	
	Officers.	Enlisted men.	Officers.	Enlisted men.
Cuba	23	237	99	1,322
Porto Rico.....	.....	3	4	38
Manila.....	.....	17	10	96
Total	23	257	113	1,454

The Secretary also reported: "The number of deaths from all causes, between May 1 and September 30, inclusive, as reported to the Adjutant-General's office up to October 3, were: Killed, 23 officers and 257 enlisted men; died of wounds, 4 officers and 61 enlisted men; died of disease, 80 officers and 2,485 enlisted men. Total, 107 officers and 2,803 enlisted men, being an aggregate of 2,910 out of a total force of 274,717 officers and men, or a percentage of 1.059." In the navy the casualties were: killed, 17; wounded, 67; died of wounds, 1; invalided, 6; total, 91.

SPANISH LITERATURE. *History.*—In view of the disturbed condition of Spain during the past year, it is not surprising that there should have been a smaller number of books published, especially of those representing imaginative literature. In historical works, however, there has been a marked increase, and some of the recent treatises are of unusual interest. In the first place, the voluminous collection of *Relaciones Geográficas de Indias*, edited by S. Jimenez de la Espada, and begun in 1881, was brought to a close towards the end of 1897. Its importance lies in the fact that the majority of the documents it contains are official papers, dating from the earliest times drawn up by Spanish navigators and explorers in America, for the purpose of affording the Spanish government accurate knowledge of the new countries. In the *Memorial Histórico Español*, published by the Academy of History, Señor Danvila has contributed a *Historia Crítica y Documentada de las Comunidades de Castilla*, based upon upward of 7,500 inedited documents. Señor Fernandez Duro continues his task of chronicling the Spanish marine in a third volume, relating the deeds of the navy during the last years of Philip II; and Lopez Ferreiro devotes the second volume of his *Galicia in the Last Third of the Fifteenth Century*, to an examination of reforms introduced by Catholic kings, and an account of illustrious Galicians. Don Julian Ribera, professor at the university at Zaragoza, has written a valuable history of the *Justicia of Aragon*, which he traces through the Mohammedans to Persian sources. Señor Bethencourt has undertaken a sumptuous and extensive *Historia General y Heraldica de la Monarquía Española*, which will appeal especially to students of heraldry. Señor Uhagon, recently elected to the Academy of History, wrote for the occasion an excellent study on Spanish *Ordenes Militares*, especially that of Calatrave under the government of D. Pedro Girón. Catalonia has received attention not only in an extensive *Historia de Cataluña*, by Señor A. Bori y Fontesta, but also in two monographs: *Hegemonia de Barcelona en Cataluña durante el Siglo XI*, by Señor Carreras y Candi, and *Determinacio de los Comarques Naturals e Historiques de Cataluña*, by Señor Font, included in the volume of *Jochs Florals* for 1897. Señor J. Guichot has diligently investigated the *Historia del Ayuntamiento de Sevilla*; and interesting contributions to Basque history have been made by Señor Aprais in *Los Isunzos de Vitoria: Euskariana*, by Señor Campion, and *El arbol de Guernica*, by Señor Olascogoa. A work of timely interest is an elaborate *Historia General de Filipinas*, by Llorens y Asensio, including a catalogue of the documents referring to those islands preserved in the Archivo General de Indias. The first section was issued last November. In this connection should also be mentioned an extensive *Bibliografía Española de las Islas Filipinas*, covering the years 1523-1810, compiled by J. T. Medina, and published in Santiago de Chile. Other works which deserve at least a passing notice are *Lusitania Celtibérica*, by Arenas López, who tries to prove that a district separate from Western Lusitania figured among the divisions of the Roman Empire; a *Historia de la Provincia de Ciudad Real*, by A. Blasquez y Delgado Aguilera; *Historia de la Provincia del Uruguay*, in five volumes, translated by Señor Serrano y Sanz, from the Latin of Father N. Del Techo; a two volume history of the *Guerra de Anexion en Portugal durante el Reinado de Don Felipe II*, by J. Suarez Inclan. The fourth and concluding volume of Señor C. de Torata's *Documentos para la Historia de la Guerra Separatista del Peru*; and an interesting monograph by Señor Pedreira upon *La Derrota de Nelson en Santa Cruz de Tenerife*. An important contribution to the history of commerce is F. Perez del

Toro's *Compendio de Historia General del Desarrollo del Comercio y de la Industria*, the first volume of which appeared in August.

Biography.—Of historical as well as biographical interest are Señor Murguía's life of D. Diego Gelmirez, which presents quite a synthetic picture of the church of Campostello and Galician history; and Señor Villalba's memoir of Ruiz del Padron, discussing the political struggles of the present century. The principal biographical works of the year, however, are those which bear upon the history of literature. Of these, the first in importance is undoubtedly the life of Quevedo, by Señor Menéndez y Pelayo, who has not only written a definite biography of the great satirist, but has given us a complete and correct text of his works, largely based upon the material collected by Señor Fernandez Guerra. A volume which received a prize from the Spanish Academy is Señor Cotarelo's life of Yriarte, containing many curious and hitherto unpublished facts. Other volumes deserving mention are: a memoir, by Catalina y Garcia, of the Academy of History, of Fr. José de Sigüenza, known in Spanish literature for his *History of the Order of St. Jerome*; a monograph on P. Arolas, by a promising young critic, Señor Lomba; and Señor Aramburo's *Personalidad literaria de Doña Gertrudis Gómez de Avellaneda*. Artistic biography is represented by a *Diccionario de Artistas Valencianos*, by Señor Barón de Alcahalí, as well as a *Biografía de D. Ventura Rodríguez Tizón*, "as architect and restorer of classic art in Spain during the 18th century;" by Pulido López and Diaz Galdós.

Poetry.—Catalonia continues to produce poets of a high order. Among the recent comers may be mentioned Guanyabens with his *Alades*; Massó, with *Natura*; Morera with *Poesias*; Verdaguer, with *Santa Eulalia*. Among the recent volumes from poets already known by previous efforts may be mentioned *Corazonadas*, by Eusebio Blasco; *Poetas del Amor*, by Herrero, consisting of translations from the Sanskrit of Kalidasa and the German of Heine; and *La Caja de Música*, by Gil.

Fiction.—The fiction for 1898 is on the whole disappointing, neither Pereda, Malera, or Valdés having produced anything of real significance. The one notable book is *El Abuelo*, by that prolific writer Perez Galdós, a powerful story written in dramatic form and partly inspired by *King Lear*. Aside from his *Gloria* and *Doña Perfecta*, Galdós is probably best known as author of two series of *Episodios Nacionales*, comprising in all twenty volumes. This year he begins a third series of ten volumes, the first of which is devoted to *Zumalacarregui*, the Carlist champion of the first civil war.

Don Juan Valera publishes two volumes of articles which have already appeared elsewhere: *A Vulla Pluma* and *De Varios Colores*. Madame Emilia Pardo Bazán, the most prominent member of her sex in Spanish letters, has published three volumes, *El Saludo de las Brujas*; *El Tesoro de Gaston*, and a collection of short sketches, *Cuentos de Amor*.

A collection of tales by Narcise Oller, published under the title *Figura y Paisaje*, deserves especially to be emphasized. In the group of younger novelists, those deserving of special mention are Juan Ochoa, whose latest work is *Un Alma de Dios*; Arturo Campion, who has painted the struggle between the Liberals and Carlists in *Blancos y Negros*; Arturo Reyes, whose *El Lagar de la Viñuela* has met with the same favor as his earlier *Cartucherita*; and Pascual Queral, whose *La Ley del Embudo* is more of a political satire than a novel.

SPECIES (ZOÖLOGY). The year 1898 has shown no falling off in the number of new species which zoölogists have added to their lists and it is a matter of no little interest to examine the statistics for the year and see in just what fields the most additions are being made. We shall then be able to form a better idea of these "new" species, even if we cannot hope to throw much light on the more abstruse question of the ultimate origin of species. As near as it is possible to gather statistics, more than 6,000 species of animals have been named and described more or less fully by zoölogists in all parts of the world during 1898. As would naturally be supposed from the fact that insects are a far more numerous group of animals than all other groups combined, much the greater proportion of the new species are insects. Indeed, not less than sixty per cent., and very probably two-thirds, of the new names are those of insects. Very much the larger part of these 4,000 insects are beetles, butterflies and moths, or ants, bees and wasps, and moreover most of them are from the tropics, Africa and India furnishing a large share. Next to insects, we find the allied groups of spiders, centipedes, scorpions, and crustaceans furnishing the largest number of new species, about 15 per cent. of the total, say 900 forms. Mollusks comprise only about seven per cent. and vertebrates less than ten, the worms, echinoderms, polyzoa, sponges, coelenterates, protozoa, etc., furnishing the remainder. About one-third of the new vertebrates described are mammals, while the new birds and fishes are about equal in number, reptiles next and Amphibians furnish the smallest number of all. Of all the new mammals described, doubtless the most interesting is a living species of ground sloth, hitherto known only as fossil forms. The new species is found in the interior of Patagonia and though only fragments of a single specimen have as yet been examined there seems to be no doubt of

the correctness of the identification. It is a small nocturnal animal and has been named *Neomylodon listæ*. In the deeper layers of the skin, which is two centimeters thick and covered with reddish-gray hair, are imbedded the characteristic bony ossicles, as large as coffee berries. The figures above given are for living forms only and include none of the numerous fossil forms described, so that the question naturally arises, Whence came all these new animals? An examination of the data obtainable shows that the great bulk of them come from countries where zoölogy as a science is in its infancy if it exists at all, but where scientific explorations have been carried on successfully, and have thus revealed great numbers of animals previously unknown. Many of the new insects and a large proportion of the new spiders, scorpions, etc., are from countries where the more showy animals, the birds, the butterflies, and the beetles have already been well studied, but where the less noticeable elements of the fauna have hitherto escaped notice. Thus many of the scorpions and centipedes described during 1898 are from the countries of South and Central America, whose birds and butterflies are already pretty well known. But there are at least two other sources of new species, which are of considerable importance. One is the study of the groups of inconspicuous, generally small, often microscopic animals, such as rotifers and copepods, in countries where zoölogy is a widely recognized science as in the United States. The other is the more careful, detailed study of large series of specimens of well-known groups, from a wide extent of territory, with the result that species long recognized are separated into two or more forms. If the new forms intergrade perceptibly with the old, they may simply be called sub-species, but otherwise they are considered good species. Many of the forms of birds and mammals which have been described recently as new, have been discovered in this way. In such cases the "personal equation" enters very largely and some zoölogists are quite ready to recognize as valid species what others will scarcely accept as varieties. The result is that there is always more or less confusion and it is a pity that the practice of the American Ornithologists' Union is not universal in zoölogy. That organization has a standing committee whose duty it is to pass judgment on all the new species or sub-species of North American birds described, and without their consent and approval no such forms are recognized as valid. Another remedy for the present state of affairs would be to have a precise criterion of species, so that it would be possible to show mathematically whether a given form should be recognized as a species or not. During the past year, Professor Davenport, of Harvard, has published a scheme by means of which he hopes to furnish this desired criterion. His plan involves the use of mathematical data, and the plotting of curves and will be of real value where the characteristics are such that they can be expressed in mathematical units, but in such matters as color, form, habits, etc., it would seem there is still too much room left for the personal equation.

There has been no notable advance made during the year in the solution of the problem of the ultimate origin of species. Zoölogists are pretty well agreed that hybridization is not one of the means used in Nature, nevertheless no little interest attaches to hybrids. The most interesting one described during the year is that between Burchell's zebra and mares of various breeds. The hybrids are said to be shapely and attractive and promise to be hardy and useful, and it is hoped will prove of value in Africa and India.

SPECIFIC HEATS OF GASES, RATIO OF. See PHYSICS (paragraph Ratio of the Specific Heats of Gases).

SPECTROSCOPE. See PHYSICS (paragraph A Simple Interpolation Formula for Prismatic Spectrum).

SPECTROSCOPE, THE ECHELON. See PHYSICS (paragraph The Echelon Spectroscope).

SPERMATOGENESIS (IN PLANTS). See BOTANY (paragraph Cytology).

SPERMATOZOID. See BOTANY (paragraph Cytology).

SPENCER, JESSE AMES, S. T. D., Episcopal clergyman, died at Passaic, New Jersey, September 2, 1898. He was born at Hyde Park, New York, June 17, 1816; was graduated at Columbia College in 1837, and at the Episcopal General Theological Seminary three years later. He was rector of churches in Goshen, N. Y.; Burlington, Vt., and Flatbush, N. Y., and of the Anton Memorial Church, Eleventh street, New York, and in 1869 accepted the chair of Greek in the college of the City of New York, remaining in active service for ten years. He contributed largely to periodicals, edited the Greek Testament and a number of classical texts, and wrote several volumes, including the following: *History of the Reformation in England; The East, Sketch of Travel in Egypt and the Holy Land; The Christian Instructed in the Ways of the Gospel and the Church; The Young Ruler Who Had Great Possessions, and Other Discourses; A Course of English Reading; History of the United States from the Earliest Period to the Death of President Lincoln; Sketch of the History of the Protestant Episcopal Church in the United States; Five Last Things, Studies in Eschatology.*

SPIRITS. See CHARCOAL IN THE PURIFICATION OF SPIRITS.

SPIRITUALISM. During the year 1898 the doctrine of the Spiritualists that it is possible, by means of the so-called trance mediums, to communicate with the spirits of deceased persons, received what is by many scientific men believed to be an extraordinary corroboration in the case of the trances of a certain Mrs. Piper. This woman has been for fifteen years under the observation of the secretary of the Society for Psychical Research (q. v.), Richard Hodgson, LL. D., who has, with the utmost scientific rigor, made investigations into the nature and results of her performances.

In the following account of Mrs. Piper's trances it will be assumed for the present that the statements of Dr. Hodgson are truthful, and later will be noticed the doubts that might be thrown upon the honesty of Mrs. Piper or her recorders. It may be well to remark, at the outset, that Mrs. Piper has been visited by numerous scientific people, both psychologists and others, all of whom have come in a skeptical mood and many of whom have gone away convinced that the knowledge exhibited by the entranced Mrs. Piper is such as could be attained only by some means other than the ordinary preceptions of the usual five senses. It is true that not all of the scientists and eminent men of letters, who have seen Mrs. Piper, have been impressed by the truth of her utterances, which indeed have been by some condemned as in the first place of too trivial a nature, and in the second place too much intermingled with nonsense, to be worth serious consideration. The charge of triviality will be considered later. It is enough here to say that a number of the best known and most eminent psychologists in America, including Professors William James, of Harvard University, and James H. Hyslop, of Columbia University, have found in Mrs. Piper a subject of the greatest importance for the study of that phase of mental life unfortunately so intangible in the laboratory.

Nature of Mrs. Piper's Trances.—1. There has never been any doubt as to the genuineness of the trances into which this medium falls. All the tests known to physicians have endeavored in vain to detect any shamming. That the trances are real is the more credible as she has been known to fail, completely, to bring on the trance at times when sittings had been arranged for, and it was very desirable that she should enter the trance which, if never genuine could always be simulated. Ordinarily she goes into the trance voluntarily, sitting down in a chair and doing some insignificant thing with her hands. Formerly there used to be some convulsion but now there is none. Lately the activity displayed during the trances has taken the form of motions of the hand and arm, especially writing, while formerly there was much talking represented as coming from the personality of a so-called Dr. Phinuit. At Mrs. Piper's seances rappings and levitations are unknown. Questions are put by the persons for whom the sittings have been arranged and the answers are given in writing. Personal contact is not necessary. Many verbatim reports of sittings are on record. These writings were at first, and still continue to be, at times illegible. But a very great improvement has been noticed. This is said to be due to the presence at every recent sitting, of two spirits who, as it were, superintend the whole performance. These spirits are represented to be the same as those concerned in the mediumistic performances of W. Stanton Moses (deceased) and go by the names of "Imperator" and "Rector." It is represented that they divide their labors as follows: "Rector" takes immediate control of the organism of Mrs. Piper after she has lost consciousness, and uses it as a writing machine, taking down the words of the spirits of the departed, several of whom often desire to write at the same time. Order is here maintained by "Imperator," who not only decides what spirits shall be allowed to communicate with the sitters, but protects the medium from the importunities of other spirits. It would thus appear that there are, at one of Mrs. Piper's sittings, besides herself four personalities involved: (1) the sitter or person who has come to consult the medium or to test her powers; (2) the spirit with whom he wishes to communicate; (3) "Rector," and (4) "Imperator."

Nature of the Communications.—An extraordinary difference is observed between the kind of communications obtained through Mrs. Piper's mediumship and those given by other mediums of authentic history. The only others concerning which data of anything like historical accuracy have been recorded are Alexis Didier, a young Frenchman, who was exhibited in England in 1844, and Adèle Maginot, a French woman whose mediumistic trances were carefully recorded in two volumes edited by Alphonse Cahagnet in 1848-49, and entitled *Arcanes de la vie Future Devoilés* (*Secrets of the Future Life Revealed*). There is a striking similarity in the nature of the communications of these two mediums noticed by Mr. Frank Podmore. (See the *Proceedings* of the Society for Psychical Research for December 1898.) They both were seers of visions, claiming to have the ability to project their own spirits into unlimited space and to converse, both with living persons, at an otherwise impossible distance, and with the dead. The definite charge that they collected information about living and dead persons and retailed it to persons whom they chose as victims

to be duped in this way was not, moreover, sufficiently obviated. The two French mediums, besides, laid great stress on the accuracy of their names, places and dates, as do the ordinary professional fraudulent mediums.

In all these features Mrs. Piper's trance communications are quite different. She has not been a seer of visions, but her messages are represented to have been given to her verbally and communicated *viva voce* or by writing. In addition to the written records of her trance-utterance; she has been at times, though not continuously under the strictest watch for anything that could be called detective work on her part or on the part of any supposed accomplices; and her trunks, bureaux, etc., have been repeatedly and at unexpected times searched for any documents of an incriminating character. But as Prof. William James has emphatically declared: "The medium has been under observation, much of the time under close observation, as to most of the conditions of her life by a large number of persons, eager, many of them, to pounce upon any suspicious circumstance, for fifteen years. During that time not only has there not been one *suspicious circumstance remarked, but not one suggestion has ever been made from any quarter* which might tend positively to explain how the medium, living the apparent life she leads, could possibly collect information about so many sitters by natural means."

Mrs. Piper's communications have not all been intelligible, nor all her seances successful, about 10 per cent. of them having been unsatisfactory, which is a very small proportion; and her statements with regard to dates on which the events described were represented as having happened have been many times found to be inaccurate. But the greatest and most important feature of the messages which come through the voice or the hand of Mrs. Piper is the fact that those messages, in phraseology and in matters of fact referred to, show striking internal evidence of having been the utterances of the personality they claim to have emanated from. Those who have had the most successful sittings with Mrs. Piper come away in amazement at the wonderful revelations of the personality with whom they have communicated, and this without the slightest reference to what the state of existence of that personality may have been.

The Telepathy Hypothesis.—Accepting the facts of Mrs. Piper's trance, viz.: that she shows a marvellous knowledge of the private affairs of almost all the persons who visit her during her trances; the question as to how she obtains this knowledge, if not by natural means is answered in two ways: The first of these is that she might be reading the minds of the sitters. Telepathy would, however, satisfactorily explain the medium's knowledge only of such things as were in the sitter's mind at the time, a thing which, in some of the seances, is conceivable. The proposition that the medium reads from a sitter's mind what is not in his mind at the time, but only in his memory (or out of memory where he would not himself be able to know it) is almost too preposterous to be accepted, though even this has been proposed by some persons, who prefer it to the spirit hypothesis which they consider to be equally impossible, viz.: that the communication really comes through Mrs. Piper's brain from the disembodied spirit of some deceased friend or relative.

It is true that there is a subliminal mind or a mind below the threshold of consciousness constituted by all the mental states in the whole of the sitter's past experience. The workings of this mind are seen in cases where mathematical problems have been worked out during sleep or where an inspiration for a picture comes to an artist in a dream, or in any case where the consciousness is not in the fully waking state. This subliminal self, or subconscious self or secondary personality (see HYPNOTISM) frequently carries on some kind of activity while the waking consciousness is engaged in something entirely different. It has been supposed that, while the sitter's waking consciousness has been absorbed in the grotesque and dramatic incidents of the seance, his subliminal mind was communicating to the medium by means of telepathy, the very facts which her pencil was writing down. But against this theory has been urged the fact that many instances have occurred where the medium told of matters that the sitter even, in the whole of his past experience, could never have become acquainted with and thus supposedly *could not exist in any form in his own mind either above or below the threshold of consciousness*. Thus the supposition that telepathy or transference of thought from the sitter's consciousness or from his subconsciousness or subliminal mind to the brain of the medium appears to be untenable.

The Spirit Hypothesis.—The only alternative, then, apart from the supposition of conscious or unconscious imposture, is to regard the communications, as in reality what they purport to be—the utterances of some discarnate personality by means of the medium's brain, regarded, as has been said, in the light of a machine for speaking or writing from which the personality of Mrs. Piper temporarily departs. Those who contend for this theory point out that on this supposition all the superficial objections as to the triviality of some of the messages and the incoherence of others vanish. For it is quite conceivable that if the brain of the medium is made the material

mechanical means of expression of a personality, the imperfections of the machine would naturally be very great and its adaptability to express a different personality comparatively small. Dr. Hodgson, who has scouted the spiritistic idea in Mrs. Piper's case for over fifteen years, has (in the *Proceedings* of the Society for Psychical Research of February, 1898) declared that the spirit hypothesis comes nearest to explaining the facts as he knows them to be.

During 1898 Mrs. Piper's seances were devoted primarily to the establishing of evidence bearing upon the spiritistic view and it is understood that this will be the case for some time to come; and that no sittings for purely personal purposes will be given; as the most rigorous investigations are to be continued. This evidence includes the recognizing of persons whom Mrs. Piper has never before seen or heard of, or who come into her presence with masks over their faces, the recognizing of small objects such as knives, jewelry, etc., which have been worn or owned by the person with whom the sitter wishes, by Mrs. Piper's aid, to be put into communication; and finally she has shown a knowledge of past events in the private history of her sitters which the most skeptical of scientific minds find it difficult to explain, as acquired in any normal way, and which form a stronger evidence from the fact that to so large a proportion of her visitors (90 per cent.) she is enabled to exhibit this extraordinary ability.

Perhaps one of the most dramatic and impressive examples of the trance utterances of Mrs. Piper is that reported in February 1898. The personality of a young man (pseudonym George Pelham) a friend of Mr. Hodgson's is said to have figured in this trance. Pelham died in 1892. He and Dr. Hodgson used to have talks together on scientific and philosophical questions frequently reverting to the doctrine of the immortality of the soul. Pelham one day said, jokingly: "Well, if I die before you I will make things lively until I can communicate with you and let you know of my *post-mortem* existence." Two months after his death his spirit was present at a seance of Mrs. Piper's and gave several tokens of his individuality, such as messages concerning matters known only to himself and to Dr. Hodgson. At this seance a third person addressed as "Jim" was supposed to be present. The communications proceed as follows: "Pelham: Jim, is that you? Speak to me quick. I am not dead. Don't think me dead. I'm awfully glad to see you. Can't you see me? Don't you hear me? Give my love to my father and tell him I want to see him. I am happy here, and more so, since I find I can communicate with you. I pity those people who can't speak * * * I want you to know that I think of you still. I spoke to John about some letters. I left things terribly mixed, my books and my papers. You will forgive me for this won't you?"

* * * I am scarcely able to do anything yet; I am just awakened to the reality of life after death. It was like darkness. I could not distinguish anything at first. Darkest hours just before dawn, you know that Jim. I was puzzled, confused. Shall have an occupation soon. Now I can see you, my friends. I can hear you speak. Your voice, Jim, I can distinguish with your accent and articulation, but it sounds like a big bass drum. Mine would sound to you like the faintest whisper. * * * Greatly surprised. I did not believe in a future life. It was beyond my reasoning powers. Now it is as clear to me as daylight. We have an astral fac-simile of the material body. * * * Jim, what are you writing now? [Nothing of any importance.] Why don't you write about this? [I should like to, but the expression of my opinion would be nothing, I must have facts.] These I will give to you and to Hodgson if he is still interested in these things. [Will people know about this possibility of communication?] They are sure to in the end. It is only a question of time when people in the material body will know all about it and every one will be able to communicate."

While the account of the spiritistic hypothesis, given in this article, seems to be in corroboration of the claims of the psychical researchers, it must not be understood that their claims have been accepted in any way by even a large number of the psychologists of the world; as probably the greater number of the most prominent psychologists of Europe and of the United States have doubted not only the interpretation placed upon the facts as here narrated from matter furnished by the Society for Psychical Research, but have even doubted the facts themselves, and in view of the past history of spiritualism, hypnotism and other not accepted sciences, the safer course is the sceptical. Whether credible or not, however, the facts are interesting and important both because of the prominence in the scientific world, of the supporters of these claims, and the unique way in which the facts have been, for so long a period, collected and studied.

SPIRITUALISTS. The belief in Spiritualism is growing steadily in the United States. The National Spiritualists' Association, organized in Chicago in 1893 and incorporated the same year, has its headquarters in Washington, D. C. Its aims are "the organization of the various Spiritualistic societies of the United States and

Canada into one general association, for the purpose of mutual aid and coöperation in benevolent, charitable, educational, literary, musical, scientific, religious and missionary purposes, and enterprises germane to the phenomena, science, philosophy, and religion of Spiritualism." The report of 1898 gives 660 local associations in the United States and Canada, 15 State associations, 52 camp-meeting associations, with a membership of 150,000. The total number of Spiritualists in the United States and Canada is 1,500,000. They have 350 lecturers, ministers and platform mediums, 1,500 psychics and 10,000 mediums. Their real estate is valued at \$1,200,000. Ten periodicals are published. President, Harrison D. Barrett, Needham, Mass.; Secretary, Mary T. Longley, Los Angeles, Cal.

STAND PIPE. See WATERWORKS.

STANFORD, CHARLES VILLIERS, composer, born in Dublin, Sept. 30, 1852. He was educated at Cambridge and studied music in Leipzig under Reinecke and in Berlin under Kiel. In 1872-93 he was organist of Trinity College, Cambridge, and conductor of the Cambridge University Musical Society. He has written symphonies, oratorios, operas, ballads for orchestra, chamber-music, songs etc. His most recent compositions are: Fourth Symphony in F; Fifth Symphony in D; *Shamus O'Brien*, opera; *Requiem* in A (Birmingham Festival, 1897); *Te Deum* (Leeds Festival, 1898); *Irish Fantasies* for violin; and three string quartets. Oxford gave him his degree of Mus. Doc. in 1883.

STANSFELD, Rt. Hon. Sir JAMES, P. C., G. C. B. (1895), died February 17, 1898. He was born at Halifax, Yorkshire, in 1820. In 1849 he became Barrister of the Inner Temple. He represented Halifax in Parliament from 1859 till his retirement in 1895. He was made Lord of the Admiralty (1863-64); Under-Secretary for India (1866); Lord of the Treasury (1868-69); President of the Poor-Law Board (1871); President of the Local Government Board (1871-74 and 1886).

STAR-CATALOGUES. See ASTRONOMY.

STARK, BENJAMIN ex-United States Senator from Oregon, died at New London, Connecticut, October 10, 1898. He was born at New Orleans, Louisiana, June 26, 1820; was educated in New London and went to Oregon in 1845, becoming one of the founders of Portland. He was a member of the Territorial House of Representatives in 1853, and in 1860 was sent to the State legislature. In 1862 he was appointed, as a Democrat, to a vacancy in the Federal Senate.

STARVATION. See PUBLIC HEALTH.

STATISTICAL ASSOCIATION, AMERICAN, founded in 1839, has 579 members. President, Carroll D. Wright; Vice-Presidents, Richmond Mayo-Smith, Horace G. Wadlin, Henry C. Adams, John W. Dean, and Henry Gannett; Corresponding Secretary, Davis R. Dewey, Boston; Treasurer, John S. Clark.

STEEVENS, GEORGE WARRINGTON, author, born Dec. 10, 1869. He was educated in London and Oxford and joined the staff of the *Pall Mall Gazette* in 1893 and the *Daily Mail* in 1897. He is the author of: *Naval Policy* (1896); *Monologues of the Dead* (1896); *The Land of the Dollar* (1897); *With the Conquering Turk* (1897); *Egypt in 1898* (1898); and *With Kitchener to Khartoum* (1898).

STELLAR PARALLAX. See ASTRONOMICAL PROGRESS.

STELLAR PHOTOGRAPHY. See ASTRONOMICAL PROGRESS.

STOKES, REV. GEORGE THOMAS, D. D., professor of ecclesiastical history in the University of Dublin, died March 24, 1898. He was born in Athlone, Westmeath, Ireland, December 28, 1843; was educated at Queen's College, Galway, and Trinity College, Dublin, and, after acting as curate in Killaloe and Newry, became, in 1869, Vicar of All Saints, Blackrock, which position he retained until the time of his death. He accepted the chair of church history at Dublin in 1883. In 1893 he became canon of S. Patrick's Dublin. His published writings include: *Ireland and the Celtic Church* (1886); *Sketch of Mediæval History* (1887); *Ireland and the Anglo-Norman Church* (1889); *Bishop Pocock's Tour Around Ireland in 1752* (1891); *The Acts of the Apostles*, 2 vols., in "Expositor's Bible" series (1891-92); *Greek in Gaul and Western Europe Down to A. D. 700* (1892). For Smith's "Dictionary of Christian Biography," he wrote articles on the martyrs, saints, and heretics of the early church.

STORAGE BATTERY. See ACCUMULATORS.

STORY, MRS. JULIAN (Emma Eames), opera singer, born in Shanghai, China, of American parents, Aug. 13, 1867. Her father was a lawyer. After studying in Paris, she made her *début* at the Paris Opéra in 1889, and in London in 1891. In that year she was married to Julian Story, the painter. She first sang in New York in December, 1891, in *Roméo et Juliette* with Jean and Edouard de Reszké. She has sung in Bayreuth and was a member of the Grau Company of 1898-9.

STRAFFORD, Third Earl of, GEORGE HENRY CHARLES BYNG, died in London March 28, 1898. He was born in that city in 1830; was educated at Eton and at Christ Church, Oxford, and made a good record for proficiency in modern languages and the classics, receiving his M. A. from Oxford in 1854. He was Lord-in-Waiting to the Queen; Parliamentary Under Secretary of the Poor-Law Board; Under Secretary of State for Foreign Affairs and for India; he represented Tavistock in Parliament, but from 1852 to 1874 was member from Middlesex; in the latter year he entered the House of Lords. Lord Strafford was a Whig.

STRAITS SETTLEMENTS are the British settlements in the Straits of Malacca on the west coast of the Malay Peninsula, including Singapore, Penang or Prince of Wales Island, Malacca, Province Wellesley and the Dindings. The area is 1,475 sq. m. and the population in 1891 was 512,342. The chief city is Singapore, which is a great commercial centre and has a population of 184,554. The British have recently extended their authority over several Malay states on the mainland, which have been formed into a confederation under a British protectorate. These states are Perak, Selangor, Penang and Negri Sembilan, having an area of about 35,500 sq. m. and a population of 418,527 in 1891. A large number of immigrants enter the colony each year. These are chiefly Chinese, who numbered in 1896, 199,282. The executive authority is vested in a governor appointed by the Crown and an Executive Council of 8 members. There is also a legislative council consisting chiefly of Crown appointees. There is no duty on imports or exports and the revenues are acquired from licenses, port and harbor duties, land revenues and stamps. A British garrison is maintained there.

STRANAHAN, JAMES S. T., who was known as "the first citizen of Brooklyn" (N. Y.), died at Saratoga, N. Y., September 3, 1898. He was born at Peterboro, N. Y., April 25, 1808. During his long life he was interested in a large number of different enterprises. He assisted in the construction of various railroads, and was "among the first of those who, by taking stock in payment of construction, became owners of the roads they had built." In 1854 he was elected to Congress as a Republican. During the Civil War, he was president of the War Fund Committee, which established the *Brooklyn Union*—now the *Standard-Union*—so that Brooklyn might have one journal concurring with the government. Mr. Stranahan was president of the Park Commission from 1860 to 1882, and it was to his efforts more than to those of any other man that Prospect Park—one of the most beautiful parks in the country—was laid out and developed. He did much for the ferry and warehouse system; he had in charge the Sanitary Fair Commission which raised nearly \$500,000 for the Union soldiers in the Civil War; he was among the first and most influential promoters of the East River Bridge project, and became Trustee and Director of the bridge organization, presiding at its formal opening, May 24, 1883. Besides being a member of the Boards of Directors of the Brooklyn Institute, the Polytechnic Institute, and the Academy of Music, he was deeply interested in many forms of philanthropic and educational work and in everything that made for the prosperity of his city. At the time of his death it was said that he had been an exponent of the principles of Civil Service Reform long before those principles won their political victory. The city accorded Mr. Stranahan the unusual honor of erecting his statue while he was yet living.

STRAUS, OSCAR S., United States Minister to Turkey, was born in Georgia about 1851. He is a younger brother to ex-Congressman Isador Straus, and to Mr. Nathan Straus, ex-President of the Health Department of New York City. After his graduation from Columbia College and Columbia Law School, he was a member successively of the law firms of Hudson and Straus and Sterne, Straus and Thompson. In 1881 he retired from the law on account of over-work and subsequently became with his two brothers a partner in the firm of R. H. Macy and Company, New York, and Abraham and Straus, Brooklyn. In the presidential election of 1884, Mr. Straus participated in the so-called merchants' movement in New York City, which favored the election of Mr. Grover Cleveland; the latter after his inauguration appointed Mr. Straus Minister to Turkey. He inaugurated a number of diplomatic negotiations which afterward resulted happily, and among other things was largely instrumental in effecting the re-opening of American schools in the Sultan's domain. He is a member of the Chamber of Commerce, President of the National Primary League, President of the American Jewish Historical Association, Vice-President of the New York Board of Trade, and a member of the Authors', Lawyers', Democratic, and Reform clubs and the Bar Association. In politics he belongs to the sound-money, or gold, Democracy. He has issued a number of publications, including besides various magazine articles, *The Origin of the Republican Form of Government in the United States* (1885), *The Development of Religious Liberty in the United States*, *A Life of Roger Williams*, and *The Reform of the Diplomatic Service*. In August, 1898, President McKinley appointed Mr. Straus as Minister to Turkey, to succeed the Hon.

J. B. Angell, who had resigned because of his duties as President of the University of Michigan.

STRAUSS, RICHARD, composer was born in Munich, June 11, 1864. He is a pupil of W. Meyer. In 1885 he became court music-director at Meinigen and subsequently went to Munich and Weimar. He is now conductor in Berlin. His works are very strange and endeavor to interpret the philosophy of Nietzsche. Strauss has written in many forms of music including symphonies and symphonic poems. His latest compositions are *Also Sprach Zarathustra*, *Don Quixote*, and *Til Eulenspiegl*. See MUSIC.

STREET CLEANING. The methods of street cleaning so successfully introduced and carried out in New York by the late Colonel George E. Waring, Jr., are gradually being extended over the country. The essential principles involved were thorough organization on a semi-military basis, with definite areas, in certain of the most important districts, assigned to one man, to be kept constantly clean; and white uniforms to make the force readily distinguishable, especially when shirking from duty or visiting saloons against the rules. Where the small area system of constant hand-cleaning prevails each sweeper is provided with a sprinkling can, broom and shovel with short handles and two-wheeled vehicle provided with a frame for suspending a bag, and a supply of bags. Droppings are removed as nearly as possible after their fall, and deposited in the open-mouthed bag on the frame. When a bag is filled it is removed, tied, and left on the curb. The several bags may be removed in wagons, without emptying until the dump is reached, thus saving the creation of much dust in the street. Street sweepings in New York are, at least in part, towed to sea and dumped there. They are used in some cities for fertilizing parks, and farmers sometimes apply them to their land. They generally contain too much organic matter to be suitable for filling in low land for subsequent building operations.

Snow removal generally falls under the control of the street cleaning department, where it is done at all. Probably more of this work is done in New York City than elsewhere, partly owing to the fact that although the city has quite heavy snow-falls comparatively few people are provided with sleighs and sleds, hence wheeled vehicles must be used. The snow in New York is generally removed by contract, by shovelling it into carts and dumping it into the river. Although many devices for melting snow have been suggested nothing practicable for use on a large scale has been or is likely to be invented.

STREET PAVEMENTS. See PAVEMENTS.

STREET RAILWAY ASSOCIATION, AMERICAN, founded in Boston in 1881, for "the acquisition of experimental, statistical, and scientific knowledge relating to the construction, equipment, and operation of street-railways," etc., held its 17th annual convention in Boston, Mass., Sept. 6-9, 1898, with President Lang, of Toledo, Ohio, in the chair. The foreign delegates were Marcel Delmas, from Paris; A. Wiseman, from Birmingham, England; and T. Y. Dzushi and Koran Sugahara, from Tokyo, Japan. The companies belonging to this organization number 161. Charles Spencer Sargent was elected president for 1899.

STREET RAILWAYS. See CONDUIT ELECTRIC RAILWAYS, and ELECTRIC WELDING OF STREET RAILWAY RAILS.

STREPTOCOCCUS INFECTION. See SERUM THERAPY.

STRICKER, SOLOMAN, prominent scientific professor in Vienna University, died April 2, 1898. He was born at Waagneustadt, Hungary, in 1834; was educated at the Helvetic Gymnasium, Pest, the Teresianische Akademie, and the University of Vienna. He received the degree of doctor of medicine and surgery in 1858, became connected with the university faculty, and in 1868 was appointed professor of experimental pathology. About this time he edited *A Handbook of Pathology*, written jointly by him and some of the principal medical authorities in Germany and Austria. In 1873 he became professor of general and experimental pathology, and greatly extended experiments in physics, physiology, and vivisection. To Professor Stricker's investigations of living tissue and living organisms a number of important discoveries are due. His work in physiology, histology, and the history of development was of a very high character. He was also interested in physical science and in philosophy; on phases of the latter subject he published, besides many essays, seven large monographs.

STRIKES AND LOCKOUTS. It is difficult to obtain thoroughly trustworthy statistics for the strikes and lockouts for the year 1898, since the official reports on this subject are not promptly issued. The present article, therefore, will deal in part with the events of earlier years, especially 1896 and 1897, of which the official statistics were for the first time available in 1898.

Great Britain.—The Labor Department of the British Board of Trade has done excellent work in the investigation of strikes and lockouts, and its labors have ex-

tended over a number of years. In 1897 it prepared a report on the strikes and lockouts in 1896 in Great Britain and Ireland, an abstract of which was published in the United States in the Bulletin of the Department of Labor for September, 1898. The report contains a large number of tables showing for each dispute between the employer and the employees, the cause or object of the dispute, the duration, the result, and the number of working people and establishments affected. The tables are very well arranged and it is easy to analyze the figures. The following is a brief account of some of the important points established by these tables: The statistics for 1896 show that the number of persons affected by strikes and lockouts was far less than in any of the four preceding years, although the number of the strikes and lockouts exceeded that of 1895, 1893 or 1892. The aggregate number of working days lost was also far less than in any one of the four preceding years. To give some specimen figures, there were in the year 1892, 700 strikes and lockouts, and 356,799 persons affected. In 1893 there were 783 strikes and lockouts, and 636,386 persons affected. In these same years the aggregate number of working days lost was 17,381,936 in 1892, and 31,205,062 in 1893. In 1896, on the other hand, while there were 1,021 strikes and lockouts, there were only 198,687 persons affected and the aggregate number of working days lost was 3,748,525. As to the results of strikes, whether they were in favor of employees or employers, the figures show that a larger percentage resulted favorably to the employees in 1896 than in any one of the four preceding years, with the exception of 1893. In 1896, 39.5 per cent. of these disputes were settled in favor of the employees, 27.1 per cent. were compromised, indefinite, or unsettled, and 33.4 per cent. were settled in favor of the employers. Some interesting facts are shown as to industries in which the strikes and lockouts affected the greatest number of persons in 1896. The mining and quarrying industries stood first on the list in this respect and this was also true of each of the four preceding years. Next came the metal, engineering, and ship-building trades, and third the textile industries. But in each of the four preceding years the textile industries stood second in regard to the number of persons thrown out of employment. In 1896 the building trades were the only important category which showed an increase in the number of persons affected, as compared with each of the four preceding years, and in this the number was nearly as large as the number affected by strikes and lockouts in the textile industries in 1896. The number of days lost differed greatly, according to the nature of the industry in which the strikes and lockouts occurred. Thus in 1896 the greatest number of days lost was in the building trades. The mining and quarrying industries, the textile trades, and the comparatively unimportant occupations which are classed in the report as miscellaneous, were the only ones in which the number of the employees unfavorably affected by the strike or lockout exceeded the number of those who secured a favorable adjustment. Another important point investigated by the statisticians was the causes or objects of strikes and lockouts. An analysis of the figures shows that 58.3 per cent. of the total number of persons affected by strikes and lockouts were engaged in wage disputes. Next in importance came questions of working arrangements, which accounted for 16.7 per cent., and the third place was held by questions of trade unionism involving 6.1 per cent. of the whole number. The sympathetic disputes involved quite a large number of persons and strikes for the reinstatement of the discharged employees or against the employment of particular persons also involved many wage-earners. The aggregate number of working days lost was more than proportionately greater for strikes caused by wage disputes than for strikes for any other cause or object. The days lost on account of wage disputes was in 1896, 2,688,957 out of the total 3,748,525.

That strikes work incalculable damage is true enough. That they are injurious in their general effect upon the working classes is usually believed and the statement is often heard that there is a larger percentage of failures than of successes in labor disputes. The figures of this report do not support such a statement. In 1896, 39.5 per cent. of the working people affected by strikes and lockouts obtained their demands, and the disputes in the case of 27 per cent. were compromised, while disputes affecting only 33.4 per cent. were adjusted in favor of the employers. The figures in regard to the extent of strikes, that is the number of persons affected by each strike, show that a comparatively small number of disputes involved large bodies of workingmen. Thus, three strikes affected 19,141 persons, and 91 out of a total of 1,021 strikes and lockouts involved about 55 per cent. of the total number of persons. The average duration of strikes and lockouts in 1896 was 18.8 days, as compared with 21.6 in 1895. The next question taken up was the matter of the methods of settlement. In 1896, 71 per cent. of the total number of persons involved were engaged in strikes and lockouts which were settled by negotiations or conciliatory methods; while disputes involving 28.9 per cent. resulted in the submission of the working people or their loss of employment.

The Engineering Strike.—In Great Britain the great engineering strike came to an end early in the year 1898. The trouble in the engineering trade dated from more than a year back. There had been disputes affecting wages, overtime, etc., both in

the engineering and ship-building trades from the very beginning of the year 1897. In February, 1897, there occurred a very serious strike at Sunderland, where a number of engineers went out on account of difficulties with their employers over the working of machines, the pay for overtime and other matters. The Amalgamated Society of Engineers, one of the strongest and richest unions in the country, supported the demand of the men. This society is said to have had a membership of 90,000 and a fund of £350,000 which it could fall back upon in the event of a fight. The combination of firms known as the Federation of Engineering Associations complained of what they characterized as the aggressive action of the Amalgamated Society, but proposed a conference, provided the men resumed work at a certain date. The engineers imposed conditions on their side, but the employers refused to accept them, and decided on a lockout of 25 per cent. of the members of the Amalgamated Society. To this the Amalgamated Society replied by instructing all their members to quit work as soon as the lockout notices took effect. But before this happened a new conference was agreed upon and at last an adjustment was reached. This adjustment was of the nature of a compromise, but negotiations continued for some time afterwards and it was not until May 27 that the excitement over the matter subsided.

In the meanwhile, a strike of a more formidable character had developed in the engineering trades in London, where the disputes involved the hours of labor. On May 1 several trade unions, with a membership of some 15,000, sent a circular to their employers requesting an eight hour day. A number of the latter granted this request, but a good many of the larger firms took steps to oppose it. In order to secure combined action in resistance to these demands, an association, in connection with the Employers' Federation, was formed, and on June 5 it was decided to refuse the men's demands. Later, when the Employers' Federation met at Carlisle to consider the question, the representatives of the men's unions gave notice that the men would be withdrawn if their demands were not accepted. The employers saw that the demand for an eight hour day, if granted for London, would be extended to other localities, and they decided on prompt and strong measures. At a meeting, on July 1, of the Employers' Federation, the Associated Ship-builders and the Iron Trades' Employers' Association, at Manchester, it was decided that 25 per cent. of the members of the unions involved should be discharged if the threatened strike took place. This applied, not only to London, but to Glasgow and Greenock, and the cities of the northeastern and western coasts. The Amalgamated Society retaliated by giving instructions that wherever these notices were posted for the lockout of 25 per cent. of the unions the remaining 75 per cent. should withdraw at the same time. Although the boilermakers and Iron Ship-builders' Society refused to take part in this strike, its effect was felt in the chief centres of trade throughout the country. For the time it paralyzed the ship-building and allied industries. The number of men thrown out of employment is differently estimated. According to one estimate between 40,000 and 50,000 men were either on strike or locked out in the middle of October. Another estimate places it at 80,000 from the very first. As the strike went on it involved many other trades and increased the number of those thrown out of employment. Some 570 firms are said to have been involved in the dispute. The position of the men seemed to be strengthened by the fact that in London there were over 200 firms that had granted their demand, or had previously adopted the eight-hour day. Both the men and the employers were for a time sure of success, but the heavy strain on the funds of the unions was too much for them to bear. A method of compromise, proposed by the Board of Trade, was refused by the employers, who insisted that the demand for an eight hour day should not be recognized. Later the Board of Trade's suggestion of a conference on the basis of a mutual discussion of the question met with a more favorable response, and on November 24, there was a conference of representatives of the men and their employers, each with their own chairman. This proved of no avail, and a later effort of conciliation, when the employers made certain proposals looking to a settlement, also resulted unfavorably. The demands of the employers, when submitted to the workmen, were almost unanimously rejected. As time went on the expenses of the strike to the unions became enormous. It was said that about \$180,000 was paid weekly to the strikers, and besides this there was a considerable sum from outside contributions. In January, 1898, it was evident that the cause of the strikers was hopeless, and when the question of accepting the proposal of the employers was again brought to vote, it found a majority in its favor. On January 28, the unions ordered the men to resume work. Thus the demand for an eight hour day, or a forty-eight hour week, had failed of effect and employers had carried their point. For the time being, at all events, the principle that employers should be free from interference in the management of their business had won the day.

The Coal Miners' Strike (South Wales).—A serious strike occurred among the coal miners of South Wales in the spring of 1898. The cause was a dispute over wages between the masters and the men. The Coal Masters' Association offered the

men an 8¾ per cent. sliding scale, and a considerable advance in the wage rate, but settlement on these terms was rejected by the men. The masters refused to submit the dispute to arbitration. The result was a very extensive strike, in which the funds of the trades unions, which for the most part were in sympathy with the strikers, alone served to keep some 750,000 people from starvation. The men showed, as a rule, great self-control and did not resort to violence in spite of the fact that much indignation was caused by the sentence of one of their leaders to two months' imprisonment for organizing a procession with the object of intimidating some of the non-union workers. A great increase in the price of coal and considerable inconvenience to manufacturers resulted. The ports most affected by the strike were Cardiff and Newport, from which, as well as Swansea and Llanelly, the exportation of coal was greatly diminished. The strike came to an end on September, 1898, when the men accepted the terms of the masters.

In general the result was an advance of 5 per cent. on the wages paid in March, but the retention of the sliding scale arrangement for four years. The minimum wage was not adopted, but it was agreed that if wages fell below a certain point the men could terminate their arrangement on six months' notice.

France.—In France, according to the report of the Bureau of Labor for 1897, there were 356 strikes, involving 2,568 establishments, 68,875 strikers and resulting in the loss of 780,944 working days. As compared with 1896 there was a smaller number of strikes, but more workmen were involved, and here was a greater loss of time. There were fewer successful strikes in 1897 than in 1896, but the workmen that took part in successful strikes were more numerous in 1897. In 1897 there was a comparatively small percentage of failures as will appear from the following table:

Result of Strikes.	Strikes.		Strikers.	
	1896	1897	1896	1897
Succeeded	24.58	19.10	23.23	28.80
Succeeded partly	25.63	34.27	34.21	42.77
Failed	49.79	46.63	42.56	29.43
Total	100.00	100.00	100.00	100.00

The majority of the strikes, 78 per cent., involved no more than one establishment, but four strikes involved more than one hundred establishments each. The greatest number of persons engaged in strikes were employed in agriculture, forestry, and fisheries. Next in importance to these were the building trades, the textile industry and the mining industry. In regard to the cause for which strikes were undertaken, the demand for increase of wages seems to have been the chief, involving the greatest number of strikers and causing the greatest loss of time. Further details are given in the following table:

CAUSE OR OBJECT.	Successful strikes.	Partly successful strikes.	Strikes which failed.	Total strikers.	Days of work lost.
For increase of wages.....	16,442	21,302	10,061	47,805	562,178
Against reduction of wages.....	401	1,882	420	2,712	58,448
For reduction of hours of labor with present or increased wages.....	2,450	2,070	1,194	5,714	68,148
Relating to time and method of payment of wages, etc.	10,282	428	1,238	11,868	262,000
For or against modification of conditions of work	2,915	846	1,032	4,798	60,068
Against piecework	81	111	381	523	5,915
For or against modification of shop rules	456	791	183	1,430	2,285
For abolition or reduction of fines	205	.....	1,480	1,685	3,850
Against discharge of workmen, foremen, or directors, or for their reinstatement.....	1,415	1,168	7,702	10,285	178,757
For discharge of workmen, foremen, or directors.....	1,841	378	4,980	7,179	85,668
Against employment of women.....	.....	.....	48	48	687
For discharge of apprentices or limitation in number	28	85	111	160	1,076
Relating to deduction from wages for the support of insurance and aid funds	453	1,290	46	1,819	23,583
Other.....	8	700	2,105	2,813	12,243

Much alarm was caused in October, 1898, by a serious strike in the building trade in Paris, which threatened to become a general strike (see SOCIALISM), but the dispute was compromised on Oct. 16.

United States: Labor Conflict in Illinois.—In the spring of 1898 trouble arose between the miners and the operators in the coal region of Illinois, near the towns of Pana and Virden. At a convention held in the previous

year, The United Mine Workers decided upon a wage of 40 cents a ton, the rule to go into effect on April 1. The operators objected to the rate, offering only 28 cents a ton, whereupon the miners submitted the case to the State Board of Arbitration, which rendered a judgment fixing the rate at 33 cents. This verdict of the Board was accepted by the miners, but rejected by the operators. On April 1, a strike was instituted and both sides remained firm until the end of August. At that time the operators decided to import negro laborers from Alabama, who were willing to work at 28 cents a ton. The operators at Pana erected stockades, behind which the negroes worked, guarded by the sheriff; this precipitated a riot and an actual battle it was feared might take place at any time. One train load of sixty negroes was intercepted by the mob and started on its way back to the South. The culmination of the strike occurred in October at Virden, where the situation was quite similar to that at Pana. The Chicago-Virden Coal Company erected a stockade about its mines, built a tower commanding the railway tracks, and imported thirty-two ex-policemen from Chicago to guard the property. When it became known to the miners that negroes were to be imported to Virden, it was evident that they intended to resort to violence. The operators informed Governor Tanner that fighting was anticipated, and asked that State troops be sent to protect life and property; the Governor, being informed that negro laborers were to be imported from another State, refused to send troops, and telegraphed as follows, to Messrs. Loucks and Lukens, president and superintendent respectively, of the Chicago-Virden Company: "Under the present well-known conditions at Virden, if you bring in this imported labor you do so, according to your own messages, with the full knowledge that you will provoke riot and bloodshed. Therefore, you will be morally responsible, if not criminally liable, for what may happen. In my opinion the well-matured sentiment of the people of Illinois is largely opposed to the pernicious system of importation of labor, and I am not wedded to any policy which is in opposition to the people of Illinois. Hence, while I do not suppose that you care to listen to a suggestion from me, yet I venture to advise you to abandon the idea of importing labor to operate your mines."

Nevertheless, on the 12th of the month a train load of 200 negroes for the operators entered the town and was met by the striking miners, who fired on the train and lined up along the track near the stockade, where the negroes were to be left. A sharp fight ensued, but it was not ascertained whether a striker or a train guard fired the first shot. The firing continued fifteen or twenty minutes, during which thousands of shots were exchanged; then the train was sent on, none of the negroes being taken out. Nine miners and three deputies were killed and twenty or more men wounded.

Governor Tanner then ordered Captain Craig, of the Galesburg battery, and a company of the Sons of Veterans regiment to proceed to Virden, disarm every one, including the deputies of the Coal Company, and to permit no imported miners to unload in the town. The town was practically placed under martial law, and remained so for a number of weeks. The Governor issued a public statement in which, among other things, he alleged that the president and other officers of the company had precipitated the riot, that they were guilty of murder, and that he believed they would be "indicted by the grand jury of Macoupin county, and tried and convicted for this heinous offense." The statement has been made that probably the fierce attack would not have been made upon the train, had not the ignorant miners read a previous manifesto of the Governor, in which he deprecated the principle of importing labor and which the miners construed as granting them license to resort to violence. In a short speech on the day following the fight, Governor Tanner said: "I believe in the aggregate sentiment of the good people of Illinois, and that this class of undesirable citizens (the Alabama miners) shall be kept out, and that the citizens of Illinois, who are part of our community and who pay the taxes, shall be protected, and I believe in giving Illinois the benefit of it, and if I am right, and that is the public sentiment, I will take the chances of enforcing the law in advance of its enactment by the legislature."

President Loucks made a simple statement that he had the right to hire whom he pleased and that he would resort to the courts to secure for the company and its employees rights which the Constitution of the United States insures; while Superintendent Lukens asserted that he would manage the mine as he chose, even though it were necessary to resort to arms.

The affair at Virden called forth much discussion throughout the country, in which the strikers, the operators and the Governor were all severely criticised. That a company has the legal right of employing whatever citizens it chooses at any price that may be agreed upon, was admitted by everyone, except, perhaps, Governor Tanner. But it was stated by some that when the employees of any company constitute a community by themselves any attempt on the part of the employers at unjust coercion changes the case from a private to a public matter. And it was acknowledged on every hand that the company was not justified in its refusal to pay the wages

named by the Arbitration Board; for the object of the company in this refusal was to enable them, by cutting prices to maintain a more successful competition. While the strikers had the sympathy of the people in their efforts to secure a just wage, public sentiment ceased to uphold them the moment they resorted to violent measures. But the bitterest reproaches of all fell to Governor Tanner, who by his own statements, acted without the authority of the law, and failed to support the Constitution of the United States, by which a citizen of one State is at liberty to seek employment in any other State. It was alleged, and seemingly with much reason, that the Governor had expressed the views and committed the acts of an Anarchist, and many urged that he be impeached by the legislature of Illinois.

Other labor conflicts that occurred in the United States during the year were the strike of the coal miners of the Pittsburg and Monongahela districts in Pennsylvania, the New England cotton strike, the wood-workers' strike in Oshkosh in Wisconsin, and the stereotypers' strike in Chicago. The coal miners' strike resulted in no serious disturbances. The New England cotton strike took place on account of a reduction in wages and was reported to have affected about 125,000 operatives. It began in January, 1898. The reduction in wages amounted in most cases to about 10 per cent. The reason assigned by the employers for this reduction was the fall in the price of cotton. The strike practically came to an end in April when the manufacturers opened their mills, and before the close of that month large bodies of the strikers returned to their employment. In connection with the wood-workers' strike at Oshkosh a serious riot between strikers and non-Union men occurred on June 23. An angry mob gathered and for a time prevented any one from entering the factories. The Chicago stereotypers' strike arose from the refusal of the publishers of the newspapers to grant an increase of wages and a reduction of the hours of labor. The strike did not meet with the support of the Typographical Union, and the publishers found no difficulty in filling the places of the strikers. For these reasons it completely failed. An important event of the year was the rendering of a verdict on March 9 in the case of the Lattimer shooting affray. The sheriff and his deputies had been arrested on the charge of having shot and killed strikers on the public highway at Lattimer, Pa., September 10, 1897. Many of the strikers were Austrian subjects and the Austrian government made some efforts to secure an indemnity for the families of those who had been killed; but the United States government disclaimed responsibility in the matter. In defence of the strikers it was urged that they were unarmed, that they did not intend violence and that firing upon them was wholly unjustifiable. On the other hand, it was said that the sheriff had ordered them to disperse, that they had refused to obey this order and that they had actually attempted violence against him before he and his deputies fired on them. For some account of the resort to arbitration in labor disputes see the article **ARBITRATION, LABOR**.

SUBMARINE TELEGRAPH. The developments in the construction, laying and operating of submarine cables and their availability for general public use have kept pace with their extension throughout the civilized world. From a steamer-towed open barge, the facilities for laying have developed to a fleet of nearly 50 steam vessels, with every device for laying, picking up, splicing, and repairing the cable lines. From a speed rate of three words per minute, which was made on the first trans-Atlantic cables, the speed of transmission has been accelerated to 50 words per minute, and even more than that with the automatic transmitters, now coming into use with cable lines, while by the duplexing of the cables their carrying capacity is doubled. From a cost to the sender of \$100 per message, which was originally charged on the first trans-Atlantic cables, the rate from New York to London and the great cities of the continent of Europe has fallen to 25 cents per word. From several hours required for the transmission of a message and receipt of a response, the time has been so reduced that messages from the Executive Mansion to the battlefield at Santiago were sent and a response received within twelve minutes, while a message sent from the House of Representatives in Washington to the House of Parliament in London, was transmitted and the reply received in 13½ seconds.

The submarine telegraphs of the world number 1,500. Their aggregate length is 170,000 miles; their total cost is estimated at \$250,000,000, and the number of messages annually transmitted over them 6,000,000. All the grand divisions of the earth are now connected by their wires, and all oceans are crossed save the Pacific. The total length of telegraph lines of the world is 835,000 miles, the lengths of their single wires or conductors, 3,500,000 miles, and the total number of messages annually sent over them 365,000,000, or an average of 1,000,000 each day. Of the 170,000 miles of submarine telegraphs, about 150,000 belong to 35 companies operating the commercial cables, which number about 320; the remainder are mostly short lines controlled by governments, and connecting forts, batteries, signal stations, lighthouses, etc., the aggregate of government lines being about 1,150 and their total lengths about 20,000 miles. In addition to this, the governments of the world hold

about 80,000 miles of cable in stock for war purposes, ready to be laid at a moment's notice.

SUEZ CANAL. The annual meeting of the directors of the canal was held at Paris on June 7, 1898. According to the report there presented the total receipts for the year 1897 showed a considerable falling off from the receipts of the year 1896. The majority of the ships were as formerly merchant vessels, and by far the largest number of these, as well as of the other classes of vessels, were English. It was announced at the meeting that the receipts for the current year promised to show a considerable increase. The statement of the half year ending June 30, 1898, was as follows: The number of vessels passing through the canal was 1,792; the net tonnage, 4,842,078, and the traffic receipts, \$8,636,920. The nationality of the vessels was mainly British, and out of the total traffic receipts for the half year, \$5,904,926 came from British vessels.

SUGAR, AS A FOOD. Auguste Chauveau shows that the quantities of sugar, or fat, that it is necessary to add to a given ration of meat in order to obtain the best diet for a man in work, are not isodynamic quantities. An energy value of .756 in sugar is generally as effective as an energy value of 1. in the form of fat, and under some circumstances the advantage of sugar may be still greater. In the case of sugar, the ratio of nutritive value to energy value is not constant, but may increase considerably when new tissues are being formed, or as an exhausted organism is being revived; whereas in the case of fat the ratio remains practically constant. The increase in the relative nutritive value of the sugar is due to the fact that it promotes the assimilation of the proteids and reduces dissimulation. It follows that it is misleading to deduce the nutritive value of food from its heat of combustion; it is equally wrong to deduce this value exclusively from the facility with which the food is converted into muscular glycogen. As a matter of fact, the nutritive value of a food depends, not only on the energy that it is capable of supplying, but also on the indirect influence that it is capable of exerting in the renewal and formation of the anatomical elements of the body. From whatever point of view the matter is regarded the superiority of sugar over fat is very apparent. See DIET AND FOOD.

SUGAR INDUSTRY. The sugar trade of the United States for the years from 1894 to 1897 inclusive is given by the *Sugar Trade Journal*. According to this authority the receipts and distribution of raw sugar in long tons from the three sugar centres was as follows:

PLACE.	RECEIPTS IN TONS.			
	1897.	1896.	1895.	1894.
New York.....	1,013,452	1,056,377	914,120	980,821
Boston.....	176,110	183,992	165,584	171,747
Philadelphia.....	388,674	343,149	359,105	473,332
Total at the three points.....	1,594,862	1,600,895	1,448,829	1,625,900

DISTRIBUTION IN TONS.				
New York.....	1,102,038	985,014	880,070	952,343
Boston.....	180,650	169,483	157,121	170,838
Philadelphia.....	389,171	342,437	354,890	473,394
Total at the three points.....	1,668,487	1,514,281	1,401,091	1,608,405

The actual melting of raw sugar in tons was: 1895, 1,456,500; 1896, 1,508,000; 1897, 1,597,000.

The refiners' stock held in the three ports mentioned and Baltimore on Jan. 1. 1894, was 6,914 tons; 1895, 29,469 tons; 1896, 76,707 tons; 1897, 163,341 tons, and 1898, 69,716 tons.

The importers' stock at New York, the places from which imported and the tons imported were:

	1894.	1895.	1896.	1897.	1898.
	Tons.	Tons.	Tons.	Tons.	Tons.
Cuba.....	.....	6,668	34,223	42,761	2,496
Other West Indies.....	234	8,900	4,083	7,466	4,942
Brazil.....	247	400	324	6,308	394
Philippine Islands.....	2,477	7,050	6,025	34,083	6,523
Java.....	2,832	4,000	16,906	26,100	28,222
Sundries.....	.....	450	.....	4,218	.....
Total.....	5,790	27,468	61,518	132,881	44,293

The total foreign stocks for the years given were as follows:

COUNTRY.	Latest date.	1895.	1896.	1897.
United Kingdom	Jan. 1	<i>Tons.</i> 105,093	<i>Tons.</i> 188,800	<i>Tons.</i> 84,000
France, Germany, Hamburg, Austria-Hungary, Holland and Belgium.....	Jan. 6	2,170,000	2,060,000	1,976,000
Cuba (six ports).....	Jan. 4	89,500	23,684	9,250
United States.....	Jan. 5	149,298	237,234	231,851
Total.....	.....	2,518,891	2,468,718	2,301,101

The beet sugar industry of the United States has been on a rapid increase, the output of each year considerably exceeding that of the preceding year, with the exception of 1894 and 1897 both of which were almost standstill years. The actual production of sugar in tons since 1890 is as follows:

1890, 2,800 tons; 1891, 5,359; 1892, 12,091; 1893, 20,443; 1894, 20,443; 1895, 30,000; 1896, 40,000; 1897, 41,347.

The total European beet crop from 1893-94 to 1897-98 is estimated by Mr. Lichts to have been:

COUNTRIES.	1897-8.	1896-7.	1895-6.	1894-5.	1893-4.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
Germany.....	1,850,000	1,836,536	1,615,111	1,844,586	1,381,608
Austria	840,000	984,007	791,405	1,355,821	841,809
France	825,000	752,081	667,853	792,511	579,111
Russia	750,000	715,000	712,098	615,058	658,070
Belgium.....	225,000	288,000	235,795	243,957	240,317
Holland.....	125,000	174,208	108,829	84,597	75,015
Other countries.....	190,000	201,000	156,340	56,000	113,610
Total.....	4,805,000	4,900,840	4,285,429	4,792,530	3,889,535

The Sugar Situation in 1898.—A great change took place in the general condition of the sugar industry of 1898 as a result of the Spanish-American War, since by the acquisition of Puerto Rico, the Philippines, the Hawaiian Islands, and the occupation of Cuba, the United States gained control of some of the most important sugar-producing areas. The effect of this upon the European producers can be inferred from the fact that the capacity of the United States as a sugar-producer is estimated as almost exactly equal to that of Austria-Hungary, France, and Germany combined. The chief sugar-producing countries of Europe are France, Austria-Hungary, Germany, Russia, Belgium, and Holland. The chief consumers are the United States and Great Britain to which it is estimated that 42 per cent. of the product of European factories has gone in recent years. The intense competition between the sugar-producing countries of Europe and the practice of granting export bounties (see BOUNTIES ON EXPORTS) have made the question of a fair and open market very important. Nine international conferences have been held to discuss the sugar question, the last being that of Brussels in June, 1898. A writer reviewing the sugar situation in the *Political Science Quarterly* points out that the three most important factors in the sugar question at the present time are "the renewed zeal of the British Anti-Bounty League, the impending prominence of the United States in the sugar trade of the near future, and—since the failure of the Brussels conference of June, 1898—the utter hopelessness of accomplishing anything by diplomatic negotiations." The figures quoted by this writer show remarkable progress of the beet sugar industry. The proportions contributed by the cane sugar and beet sugar producers have, in fact, been completely reversed. While it is estimated that in 1840 the ratio of cane sugar to beet sugar production was 22 to 1, in 1897-98, 67 per cent. of the world's consumption was beet sugar. The bounty system continues to prevail. The resort to it in the first instance was for the purpose of temporarily improving the conditions of the trade; but, in spite of much discussion looking to the abolition of bounties, this artificial stimulus still continues, and recently the bounties have been increased in Germany and France. One of the most important aspects of the sugar situation is the fall in price. This is attributed by the writer above quoted to three leading causes: "First, the governmental bounties on exported beet sugar; secondly, the high duty and the countervailing duty imposed by the United States government upon bounty-fed sugars exported from abroad; thirdly, the inevitable over-produce-

tion arising from favoring one industry at the expense of others, and thus disregarding the rate of increase in consumption."

SUICIDE. Statistics of suicide for the civilized countries of the world are difficult to procure. It takes some time to arrange them and several years pass before it is possible to secure the returns from a sufficient number of countries to form a representative comparison. It may be of interest, however, to review some of the general results which statistical investigations of recent years have seemed to establish.

Value of Investigations.—The importance of the subject can hardly be over-estimated. The rate of suicide is, of course, a negative index to the social and economic prosperity of a community. The effort of the statistics is to show, if possible, the existence of a law, and has resulted in revealing a remarkable regularity in the recurrence of this phenomenon. This regularity has led to an interesting discussion of the compatibility between the existence of a general law governing suicides and the doctrine of the freedom of the will; for if suicides, as a whole, are governed by law, are they not more or less beyond the will of the individual? The work of statisticians has shown conclusively the enormous influence of circumstances on the individual in the matter of suicide, although it has by no means answered either one way or the other the questions involved in the discussion of free will.

Number of Suicides.—The number of suicides varies greatly in different countries. The rate is reckoned at so many per million inhabitants. Taking the average of 1887 to 1891, Professor Mayo-Smith gives for Denmark 253 per million; for France, 218; for Switzerland, 216; for Prussia, 197; for Austria, 159; for England, 80; for Norway, 66; for Italy, 52, and for Ireland, 24. In Saxony the average which he found for the period from 1862 to 1886 was 322, and for the year 1887, 340. For Russia the rate is conjectural, but is estimated at only 27. There can be no question that in all these countries the number of suicides has greatly increased, with the exception of Norway alone. In France it is said that the number has increased nearly three-fold, and in Prussia more than doubled. The average annual rate of increase has been placed at between 1 per cent. and 3 per cent., and, according to Morselli, this rate out-runs the rate of increase of the population. Another remarkable fact about suicide, is the regularity of the phenomenon. Professor Mayo-Smith says that in England the number varies less than that of homicides, and of illegitimate births; in Sweden less than for homicides and marriages, and little more than for deaths or accidental deaths; in Bavaria less than for homicides, marriages, illegitimate births and accidental deaths.

Climate and Seasons.—As to the geographical distribution of suicide it has been shown that at two centres, namely Paris and the Kingdom of Saxony, the rate is always high and that it decreased with the increase of the distance from these centres. This fact has never been satisfactorily explained. The effect of temperature is seen very clearly, for the number of suicides commonly reaches a maximum in June and gradually decreases to a minimum in December, from which it appears that not the season of extreme heat or extreme cold is the more conducive to suicide, but that the transition time of spring and early summer leads to the greatest number. Some connection between climate and the rate of suicide seems to exist.

Races.—The effect of races is seen in the greater predisposition to suicide among peoples of Germanic blood. In Saxony, as has been said, the rate is very high, and in Prussia the rates appear to be higher in those parts which show the purest Germanic blood. In Switzerland there is a higher rate of suicide in the German cantons than in others, and in Austria-Hungary, in the German provinces, than in Hungary. On the other hand there is a very low rate in Southern Italy, Spain, Ireland, Russia and Finland. Yet England, which is largely a Teutonic country, has a low rate.

Social Conditions.—There is no doubt a connection between social and economic conditions and suicide. Social conditions are hard to view apart from race influence, but there are some interesting figures showing the relative number of suicides among Protestant and Roman Catholic peoples. The purely Protestant countries seem to have the largest number of suicides on the Continent, while purely Catholic countries, like Portugal, Spain and Italy have a low rate. When the population is divided between Protestant and Catholic there is, generally speaking, a higher rate for the Protestants. Statistics of the Jews show a low rate of suicide. Another instance of the connection between social condition and suicide is seen in the statistics for countries which have a large number of educated persons among their inhabitants. These show a higher rate of suicide than communities where illiteracy is wide-spread. Prussia and Saxony, for instance, with their compulsory school education, have a far higher rate than the comparatively illiterate population of Spain and Italy. An increase in the rate of suicide follows hard times and wars. In general, it is more frequent in cities than in the country districts. Some of the large cities of the world show very high rates of suicide. For example, Morselli, on the basis of statistics covering a period of years, says that for every one hundred suicides in the country there were 464 in Stockholm, 1,233 in London, 140 in Berlin and 112 in Copenhagen.

Sex, Age and Conjugal Condition.—The influence of sex and age is also apparent. A greater proportionate number of males commit suicide than females, the ratio being generally three or four to one. The rate of suicide increases with age, but differently as between men and women. Some figures quoted by Professor Mayo-Smith for Prussia, 1877, give the greatest number of suicides for men between the ages of 50 and 70; for women between the ages of 60 and 70. In the case of both men and women his figures showed an increase of the suicidal mania at the age of 20 to 25, but there is a greater proportionate number of suicides among young women than among young men. In regard to the relation of the conjugal condition to suicide, the rate is higher for the single and the widowed and divorced than for the married state, and this is seen more clearly in the case of men than in the case of women. Among the divorced the rate of suicide is the highest. The repressive influence of maternal affection on suicide appears from the fact that widows with children are less apt to commit suicide than childless married women.

Motives and Methods.—It is very difficult to make any satisfactory classification of the motives for suicide and the classification given by some statisticians, who attempt to deal with this matter, is useless and self-contradictory. But it appears that the main cause is mental disorder, next to which stands emotional causes, such as remorse, shame, despair, etc. There are some interesting figures showing the relative favor in which certain methods of committing suicide are held, from which it appears that in all countries, except Italy, hanging is the favorite method; next to this comes drowning, and next the use of firearms. The same marvelous regularity which is discernible in the statistics of suicide as a whole, appears in this matter of the methods of committing suicide. There is a tendency for about the same proportion to resort to the same method, and not only this, but there is a regularity among those who commit suicide by poison in the choice of the poison which they use.

A New Theory of Suicide.—In the last annual meeting of the British Medical Association, Dr. Alexander Haig declared that suicide is a result of error of diet. He claims that mental depression and melancholia are due to defective circulation in the brain, and that this is due to impurity of the blood through presence of uric acid. The presence of uric acid in the blood is due to an error in the diet, which can be rectified. "The great preponderance of suicides in males may be due to several factors: (1). Men are more exposed to weather than women, and exposure may be equivalent to living in a colder climate. (2). Men eat, I believe, more meat than women. (3). Women excrete large quantities of uric acid every month at or just after the monthly period, so that, other things being equal, they will have less retention and accumulation than men; this monthly plus excretion accounts for the fact that when they do commit suicide it is often at the monthly period. Again, women suffer much less than men from gout on the one hand and stone and gravel on the other. In the same way life fluctuations explain why women suffer more than men from 15 to 20 years of age. The uric acid stored or detained in the rapid nutrition of girls about 13 or 14 years, which comes to an end about 16 or 17 years, passes through the blood about and after these latter ages, and accounts for the blood and circulation changes which end in chlorosis, headaches, depression, epilepsy and suicide. The opposite side of this picture is the rapid nutrition and retention of uric acid at 13 years, with the acute rheumatism it produces; in such girls we often get a complete alternation of rheumatism and anaemia, with headache, epilepsy, depression and suicide as more occasional co-results." (See FOOD AND DIET.)

The number of suicides in the world in a single year is said to be 180,000, the largest part of these occurring in June, the fewest in September, and nearly one-half between 6 A. M. and noon.

SULPHUR. The production for the last two years was:

1897, 1,690 long tons.

1898, 2,680 long tons.

The output came from Nevada, Utah and Louisiana, the uses are the same of those mentioned under pyrite, which is becoming a dangerous competitor of sulphur.

SUMATRA is the most westerly of the Sunda islands, and lies to the south of the Malay peninsula, from which it is separated by the Strait of Malacca. It is divided into the following districts: West Coast, East Coast, Bencoolen, Lampongs, Palembang and Acheen or Atjeh, with a total estimated area of 161,612 square miles and an estimated population, at the end of 1897, of 3,209,037. The chief towns are Padang and Bencoolen, on the eastern coast, and Palembang on the western. The people are chiefly Malays, who profess Mohammedanism. There is considerable trade in the native products, cotton, tobacco, maize, rice, and the occupations are mainly agriculture and shipping. The Dutch have had a great deal of trouble with the fierce Malay natives in Acheen. Their country was invaded by Dutch troops in 1878, but though their capital was captured, the rebellious spirit of the native chiefs was by no means put down, and there have since been frequent wars. A very formidable rebellion broke out in 1896. During that year and the early part of the next the Dutch

carried on a vigorous military operation against the rebels, and by the summer of 1897 had succeeded in reducing a large part of the country. In the summer of 1898, however, there were still reports of fighting, and it was officially announced that on June 30, 1898, the enemy had been repulsed at Edi with considerable loss. Sixty of the rebels were said to have been killed and on the Dutch side one officer and several soldiers were wounded.

SUNDAY SCHOOLS. The latest statistics of Sunday schools in all countries were gathered in 1893 at the Seventh International Sunday School Convention, held that year in St. Louis, Mo. The secretaries were E. Payson Porter, of New York, and Edward Towers, of London. According to this report the total number of teachers and scholars was 22,508,661. This does not include the Roman Catholic Sunday schools, nor those of the non-Evangelical Protestant churches. The figures are: United States of North America, 123,173 schools, 1,305,939 teachers, and 9,718,432 scholars; Canada, 8,386 schools, 69,521 teachers, and 576,064 scholars; Newfoundland and Labrador, 359 schools, 2,275 teachers, and 22,976 scholars; West Indies, 2,185 schools, 9,673 teachers, and 110,233 scholars; Central America and Mexico, 550 schools, 1,300 teachers, and 15,000 scholars; South America, 350 schools, 3,000 teachers, and 150,000 scholars; England and Wales, 37,201 schools, 585,457 teachers, and 5,976,537 scholars; Scotland, 6,275 schools, 62,994 teachers, and 694,860 scholars; Ireland, 3,584 schools, 27,740 teachers, and 308,516 scholars; Austria, 212 schools, 513 teachers, and 7,195 scholars; Belgium, 89 schools, 310 teachers, and 4,112 scholars; Denmark, 506 schools, 3,043 teachers, and 55,316 scholars; Finland, 6,853 schools, 11,534 teachers, and 147,134 scholars; France, 1,450 schools, 3,800 teachers, and 60,000 scholars; Germany, 5,900 schools, 34,983 teachers, and 749,786 scholars; Greece, 4 schools, 7 teachers, and 180 scholars; Italy, 403 schools, 654 teachers, and 10,969 scholars; Netherlands, 1,560 schools, 4,600 teachers, and 163,000 scholars; Norway, 550 schools, 4,390 teachers, and 63,980 scholars; Portugal, 11 schools, 56 teachers, and 1,066 scholars; Russia, 83 schools, 777 teachers, and 15,524 scholars; Spain, 88 schools, 180 teachers, and 3,230 scholars; Sweden, 5,750 schools, 17,200 teachers, and 242,150 scholars; Switzerland, 1,637 schools, 6,916 teachers, and 113,382 scholars; Turkey, in Europe, 35 schools, 175 teachers, and 1,564 scholars; India and Ceylon, 5,548 schools, 10,715 teachers, and 197,754 scholars; Persia, 107 schools, 440 teachers, and 4,876 scholars; Siam, 16 schools, 64 teachers, and 809 scholars; China, 105 schools, 1,053 teachers, and 5,264 scholars; Japan, 150 schools, 390 teachers, and 7,019 scholars; Central Turkey, 516 schools, 2,450 teachers, and 25,833 scholars; Africa, 4,246 schools, 8,455 teachers, and 161,394 scholars; Australasia, 4,766 schools, 54,211 teachers, and 586,029 scholars; Fiji Islands, 1,474 schools, 2,700 teachers, and 42,909 scholars; Hawaiian Islands, 230 schools, 1,413 teachers, and 15,840 scholars; and other islands, 210 schools, 800 teachers, and 10,000 scholars. The number of Roman Catholic Sunday school scholars in the United States is estimated at 800,000. The next International Sunday School Convention will be held in London in 1900.

SUNSTROKE. See **HEATSTROKE**.

SURGICAL ASSOCIATION, AMERICAN, organized by Prof. Samuel D. Gross, M. D., in New York City in 1880. Next annual meeting at Chicago, Ill., in May, 1899. President, W. W. Keen, M. D., Philadelphia, Pa.; Secretary, Herbert L. Burrell, M. D., 22 Newburg street, Boston, Mass.

SUSA. See **ARCHÆOLOGY** (paragraph Persia).

SUSPENSION BRIDGES. See **BRIDGES** (paragraph Suspension).

SUTRO, ADOLPH HEINRICH JOSEPH, millionaire philanthropist and ex-Mayor of San Francisco, California, died in San Francisco, August 8, 1898. He was born in 1830, at Aachen, Rhenish Prussia. Mr. Sutro was best known as the constructor of the famous tunnel in the town of Sutro, Lyon county, Nevada. This tunnel, costing \$6,500,000, was built for the purpose of draining the Comstock silver lode, and is the most notable mining tunnel in the United States; it is 12 feet wide, 10 feet high, and 20,500 feet long. The enterprise proved successful, for the rich silver veins, drained and made workable, yielded large returns. Having made prudent investments in San Francisco real estate, Mr. Sutro became one of the wealthiest men in the west; in 1880 he laid out Sutro Heights, San Francisco, into a beautiful park, which he opened to the public and bequeathed to the city. San Francisco received numerous other gifts from him, including fountains and statues, salt water baths and an aquarium. He was the founder of the Sutro Library, which contains about 250,000 volumes; there are excellent collections of Japanese and Sanscrit manuscripts, books on early American life, and documents dealing with the settlement of the Pacific coast. In 1894 Mr. Sutro was elected Mayor of the city as a Populist. Some months after his death it was decided by the Court that the trust clause in Mr. Sutro's will, giving Sutro Heights

as a park to the city, and San Miguel ranch for the support of a scientific school, as well as the clause providing for the public use of his library, was invalid.

SWEDEN is the eastern portion of the Scandinavian peninsula with an area of 172,876 sq. m., and an estimated population on December 31, 1895, of 4,919,260. The capital is Stockholm with a population at the end of 1896 of 297,860. The principal occupation is agriculture and the chief crops in addition to the cereals are potatoes, hemp, flax, tobacco and hops, but Sweden does not produce enough grain for the home consumption and is obliged to import considerable quantities from abroad. Since 1866 there has been a considerable advance in all branches of production. Mining is an important industry and it has recently progressed steadily owing to the introduction of new machinery. In iron mining the average earnings of the workmen are about \$200 per annum. It was reported in 1898 that at the principal mines all the boring was carried on by hand. The largest sharers in the foreign trade with Sweden are Great Britain and Germany. The leading articles of export are animals and animal products, timber, wrought and unwrought, minerals and metal goods and the chief articles of import are textile manufactures, colonial wares, corn and flour, raw textile material and yarn, etc. The total imports for 1896 were 358,314,718, kronor and the total exports 340,283,042 kronor, the krona being worth 26.8 cents in United States currency. The main source of revenue is the customs. According to the budget estimate for 1898 the national income from the customs was nearly one-third of the total revenue. Next in importance as a source of revenue was the impost on spirits, etc., and a large return came from the public domains, railway, land taxes, etc. About one-third of the railways belong to the State. At the beginning of 1898 the value of the railways owned by the State was estimated at \$85,600,000.

The debt of Sweden Jan., 1898, amounted to 287,483,444 kronor, which was incurred on the railway account. The army consists of the Varfvade, a body of enlisted troops who serve for two or three years; the Indelta, of nineteen regiments of infantry and three of cavalry, who serve for a short period in each year; and the Varnpligtige, who are recruited by levying upon the male population between the ages of 21 and 40. It was estimated in 1898 that the war strength was 52,300 men and if all classes were included, about 100,000. The navy, which is kept up for purposes of coast defense, has 17 armored coast defense turret ships; 3 corvettes and a number of torpedo boats and smaller boats of various classes. The state religion is Lutheran. In 1897 there were 12 bishoprics and 2,551 parishes.

History.—The main political question in Norway and Sweden has to do with the demand of the latter power for more complete independence in regard to foreign affairs. Some account of the conflict over this matter will be found in the article **NORWAY** (q. v.). The political parties in Sweden comprise the Conservatives, the Radicals, and the Moderates, of whom the first and last are opposed to the demands of Norway. The constitutional question was constantly agitated during the year 1898. The committee appointed to draft a plan of union was divided against itself. The Swedish members favored the choice of a foreign minister who should have charge of the foreign affairs for both Sweden and Norway and reside at Stockholm. He was to be aided by a council of state for foreign affairs, which should be made up of two councillors from each country. The majority of the Norwegian members on the other hand demanded separate foreign ministers and separate diplomatic representatives for each country.

SWEDENBORG SCIENTIFIC ASSOCIATION, organized in New York, May 27, 1898, "to preserve, translate, publish, and distribute the scientific and philosophical works of Emanuel Swedenborg; and to promote the principles taught in these works, having in view, likewise, their relation to the science and philosophy of the present day." President, Frank Sewall.

SWEDENBORGLIANS (**NEW JERUSALEM CHURCH**). There are two branches of this sect in the United States. The first consists of the following associations and societies: Canada, 5 societies and 231 members; Illinois, 14 societies and 798 members; Maine, 4 societies and 255 members; Maryland, 7 societies and 448 members; Massachusetts, 19 societies and 1,818 members; Michigan, 3 societies and 112 members; Minnesota, 3 societies and 86 members; New York, 9 societies and 651 members; Ohio, 8 societies and 494 members; Pacific Coast, 10 societies and 460 members; Pennsylvania, 7 societies and 704 members; Connecticut Association, 60 members; Denver, Col. Society, 20 members; Iowa General Society, 118 members; Jacksonville, Fla., Society, 33 members; Louisville, Ky., Society, 23 members; Milwaukee, Wis., Society, 18 members; Savannah, Ga., Society, 22 members; Texas General Society, 86 members; and Topeka, Kas., Society, 30 members, making a total of 187 societies and 12,524 members. The seventy-eighth annual session of the general convention of the new Jerusalem met in Cleveland, Ohio, June 11-14, 1898, Rev. John Worcester, President. The Council of Ministers met at Lakewood, Indiana, June 7, and agreed to continue the work mapped out during the past two years,—a version of the Bible of Swedenborg in Latin as a beginning towards mak-

ing a new-church translation in English. The compilation and publication of the translation of the Psalms in the Latin, found in the works of Swedenborg was accomplished in 1898 under the supervision of Rev. T. F. Wright. It was decided that the next work to be undertaken is a version of the Pentateuch compiled from the Latin of Swedenborg by the committee of the Council of Ministers, co-operating with the committee of the English Conference, which is now engaged on Genesis. It will be issued by the American Swedenborg Printing and Publishing Society. The total receipts for 1898 were \$5,566.25, and their endowment fund is \$20,459.37.

The eleventh annual conference of the American League of New Church Young-People's Societies also met in Cleveland, June 11, and four new societies were admitted, bringing the number to 35. The twelfth annual meeting of the Alumni Association of the New Jerusalem, Rev. Lewis F. Hite, President, met in Lakewood, Ind., June 9. The German Missionary Union of the New Church in America met in Berlin, Canada, June 16, when Rev. L. H. Tafel was elected Secretary and Dr. Felix A. Boericke, Treasurer. This Union is preparing a new edition of Dr. Tafel's German Bible. The American Swedenborg Society's headquarters is 3 West 29th street, New York. The other branch of the Swedenborgians is known as The Academy, with headquarters at Huntingdon Valley, Penn. Its present membership consists of 454 persons, including 117 for England and Canada. There are 10 societies in Pennsylvania, 5 in Ohio, 2 in New York, 2 in Illinois, 2 in California, and 1 in Colorado, Delaware, Georgia, Kansas, Maryland, Michigan, Nebraska, New Jersey, and New Mexico. In England the Swedenborgians have 75 societies, with 6,063 registered members.

SWITZERLAND, an inland country of Europe with an area of 15,975 sq m. and a population in 1897 of 3,082,989. The chief towns are Zurich (population in 1897 with suburbs 151,994), Geneva (population in 1897 with suburbs 86,535), Basle (population in 1897, 89,687), Berne (population in 1897, 49,030), Lausanne (population in 1897, 40,671). Emigration from Switzerland is not very extensive. During the five years ending with the close of 1897 the number leaving the country was 20,132 and in that year a smaller number emigrated than in any other years immediately preceding. In 1893, 6,177 persons emigrated from Switzerland, while in 1897 there were only 2,508 emigrants. Of these, over 80 per cent. went to the United States. In the year ending June 30, 1898, the number of Swiss immigrants to the United States was 1,246. It is the most mountainous country in Europe. A large part of its surface (28.4 per cent.) is unproductive and of the productive portion only 16.4 per cent. is under crops and gardens, and 18.7 per cent under fruit, while 35.8 per cent. is under grass and meadows and 29 per cent. under forest. Nevertheless agriculture is the chief occupation. Next to it the greatest number of persons are engaged in the building and furniture industries, the textile industries, commerce and the manufacture of machinery. Among the chief manufactures are cotton, silk, watches, machines and wood-work and the chief exports are silk, cotton, clocks and watches, food stuffs, tobacco and spirits. It was said in an official report in 1894 that Switzerland imported each year half of that upon which its population subsisted. Food stuffs continue to be the chief articles of import. Wheat to the value of 77,057,000 francs was imported in 1897 and in that year the leading countries from which Switzerland imported goods, were, in the order of their importance, Germany, France, Italy and Austria-Hungary, while the chief receivers of her exports were, in the order of importance, Germany, Great Britain, France and Austria-Hungary. Outside of Europe her largest trade was with American countries. The trade of Switzerland with the United States is important, but in the first six months of 1898 there was a falling off of about a million and a quarter dollars in the exports from Switzerland to the United States, the total value of which was \$6,082,793 during that period. This was due chiefly to the war and later in the year it was reported that the export trade with the United States had considerably increased. In the year ending June 30, 1898, the exports from Switzerland to the United States amounted to \$11,380,835, and the imports from the United States to Switzerland to \$263,970. It was reported by the American Consul at St. Gall in 1898 that new classes of articles of American manufacture were finding their way to the Swiss market and that there were good opportunities for the development of American trade there. Swiss commerce has increased largely through the efforts of the government to promote its foreign trade. There is a special department called the Department of Trade, Industry and Agriculture, which has for its object the promotion of trade in general, the arrangement of exhibitions, the preparation of labor laws, supervision of industrial and commercial educations, the licensing of commercial agents, the adjustment of disputes in international trade, etc. Much attention is given to participating in exhibitions. At the same time this department tries to abstain from interference with personal initiative. The aim of the government is to remove hindrances from trade and the customs duties seem to be imposed for revenue only.

Industrial and Technical Education in the Cantons.—Since 1884, when there

was a great revival of interest in industrial education, the government has pursued the practice of granting subventions to the cantonal institutions of a technical character, including schools of artisans, professional schools, schools of design, schools of arts and trade, schools of samples and models, and industrial museums. In the United States Consular Reports the reputed advancement in industrial matters is attributed in no small degree to this policy of the government. The budget estimates for 1898 were, for revenue 91,375,000 francs, and for expenditure 89,340,000 francs. The main source of revenue is the customs, for the confederation has no power to levy direct taxes. Next in importance as a source of revenue are the posts, these two items making up the greater part of the total revenue. The monetary unit is the franc, worth 19.3 cents in United States currency. For some statistics of its monetary condition see the table following the article MONEY.

Railways.—At the beginning of 1897 the mileage of the railways open for traffic was 2,351. A very important event in the history of the year 1898 was the decision of the government, as a result of the popular vote of February 20, to purchase the five main railway lines of Switzerland. The popular vote on this question gave a majority in favor of government ownership of 207,871, those voting in favor of it numbering 384,382 and those against it 176,511. The five lines to be purchased are the Jura Simplon, the Swiss North East, the Swiss Central, the United Swiss and the Gothard. This completely reverses the popular decision of December 6, 1891, when the majority against the purchase was 169,500. The change in the popular attitude is attributed largely to the thorough discussion of the subject in the press and on the platform. The cost of these five lines was placed at \$190,998,000. Their total receipts in 1897 were \$20,722,600, and their total length in 1898 was 1,700 miles. It was said that the amount which the government would pay for them was about \$200,000,000. This decision will transfer the ownership of the largest roads to the government within the next few years. The advantages which were expected to accrue from it were the greater efficiency and economy of a centralized administration, the reduction of the cost of transit for passengers and freight, the establishment of a sinking fund for the reduction of the debt and the termination of the influence exercised by foreign shareholders. For years the discussion of the question of state-ownership has been going on. The Socialists have been especially active in urging the purchase, and though they objected to many of the details of the law, they supported the government's programme. The Radicals, who control a large majority of the Assembly and the Federal Council, showed indifference and even hostility at first, but ended by enthusiastically championing the measure. The only prominent Radical to persist in his opposition was M. Numa Droz, the former President of the Confederation who published an able pamphlet pointing out the defects of the measure. The majority of those opposed to the purchase law came from the ranks of the Catholic Right and the chief ground of their opposition was the danger of centralization and of extending the powers of the Federal government. The Liberal or Liberal Conservative party also furnished many opponents of State purchase. The political aspect of the purchase was complicated by the two opposing views represented by the centralizationists and the Federalists respectively; the former favored anything that looked toward unification and desired to extend in every possible way the powers of the Federal Council and Federal Assembly, while the latter saw in State ownership a menace to the authority of the Cantons. Among the economic and financial arguments, it was claimed that the railways would not yield the expected revenues under government control. It was said that the Federal government had not taken sufficiently into account the financial burden of the undertaking and that the result would be a serious financial embarrassment. See ELECTRIC RAILWAYS.

Government.—Switzerland is a confederation of 19 Cantons and 6 half Cantons. Its present constitution dates from 1874. The Federal government consists of two chambers, the State Council and the National Assembly, the former having 44 members, two for each Canton, and the latter representatives chosen by direct vote of the adult male population at the ratio of one representative for every twenty thousand inhabitants. The elections take place every three years. Executive authority is vested in a Federal Council of seven members chosen by the Federal Assembly and in the President of the Confederation and the Vice-President of the Federal Council, also chosen by the Federal Assembly. The army is under Federal control. It comprises three classes, the Elite or active army, the Landwehr and the Landsturm. In 1898 the effective strength of these forces was 144,822; 70,000; and 300,000 respectively.

Political History.—On December 15, 1897, M. Eugene Ruffy was elected President and M. Muller Vice-President. Both were members of the Radical party. The main event of the year was the State purchase of railways, described in a preceding paragraph. Important measures of the government during the year were the submission to the people on June 20 of constitutional amendments enlarging the authority of the Federal legislature in the field of civil and criminal law and the adoption by the Assembly of illness and accident insurance laws. On September 11, the grief and indig-

nation of the people were aroused by the assassination of the Empress of Austria at Geneva by the Italian anarchist, Luccheni. There was much discussion of the tendency on the part of anarchists to make Switzerland a resort and attention was drawn to the large number that seemed to have gathered there in recent years. The Federal Council under the spur of the indignation aroused by the murder of the Empress expelled a large number of anarchists from the country. On November 13, it was decided by popular vote that the unification of the civil and penal law should be carried out. This work was of great importance and promised to take a long time. In regard to it the ex-President of the Confederation, M. Droz, said that many citizens could not but feel some hesitation when they voted in its favor, for although for the moment it would result merely in the unification of the principles of the law, it was feared that people would soon be demanding the centralization of the administration of justice as the only means of assuring a uniform procedure and jurisprudence. See ARCHÆOLOGY (paragraphs Switzerland and Germany).

SYMPHONY ORCHESTRA, BOSTON, organized in 1881, has had four conductors: George Henschel, Wilhelm Gericke, Arthur Nikisch, and Emil Paur. Mr. Gericke returned as conductor in 1898.

SYSTEMATIC BOTANY. See BOTANY (paragraph Systematic Botany).

SYSTEMATIC ZOÖLOGY. See SPECIES, also ZOÖLOGICAL LITERATURE (paragraph Systematic Zoölogy).

TALBOT, HON. SIR PATRICK WELLINGTON, K. C. B., died September 25, 1898. He was born December 11, 1817; was educated at Eton and Sandhurst; was captain in the Royal Fusiliers, 1836-46; aide-de-camp to the Lord-Lieutenant of Ireland; private secretary to Lord Derby; British resident at Cephalonia. He became a Colonel and from 1858 to the time of his death was Sergeant-at-Arms in the House of Lords; in 1897 was made K. C. B.

TALC. St. Lawrence county, N. Y., still supplies most of the talc used in paper manufacture in the United States, and the 1898 production was greatly stimulated by the increased sale of newspapers, on account of the war with Spain. Some talc for other purposes was mined in North Carolina.

TALIAFERRO, GENERAL WILLIAM BOOTH, Confederate veteran, died at Belleville, Gloucester county, Virginia, February 27, 1898. He was born there in December, 1822; was graduated from William and Mary College in 1841, and attended lectures at Harvard and entered the law. He served in the Mexican War; became Captain in the Eleventh United States Infantry in April, 1847, was promoted Major of the Ninth Infantry the following August, and was mustered out in August, 1848. At the outbreak of the Civil War he joined the Confederate army as Colonel, and served under Generals Jackson, Early, Ewell and Winder. He was prominent in the fight at Cedar Mountain, was wounded three times at Second Manassas, and for his defense of Fort Wagner, being already Brigadier-General, was commissioned Major-General. After the war he resumed the practice of law; was elected to the House of Delegates; was an unsuccessful candidate for Governor against Frederick W. M. Holliday in 1877, and was made judge of his county in 1892, serving as such until a few months before his death. General Taliaferro was a thirty-second Scottish Rite Mason, and in 1874-76 was Grand Master in Virginia.

TALL BUILDINGS. The last ten years have presented a complete transformation in the building construction methods of the larger American cities. The tall steel skeleton building from 15 stories to 30 stories in height has very largely taken the place of the former business block of 7 and 10 stories in height. As an indication of the extent of this tendency toward very tall buildings it may be stated that in the two cities of New York and Chicago there are fully 50 buildings which run from 180 ft. to 386 ft. in height. The names and main dimensions of some of the highest of these buildings are: In New York, Park Row Syndicate, 386 ft.; Manhattan Life, 348 ft.; St. Paul, 313 ft.; American Surety, 312 ft.; Pulitzer, 309 ft.; American Tract Society, 306 ft.; Empire, 304 ft. In Chicago, Masonic Temple, 273 ft.; Fisher, 235 ft.; Old Colony, 213 ft.; Monadnock, 215 ft.; Marquette, 207 ft. It will be readily comprehended that the adoption of this style of buildings and the skeleton type of construction has had the result of introducing many innovations into architectural methods and practice.

The main purpose of a tall building is to increase the rentable floor space on a given area of ground and the necessity for this has resulted from the concentration of the business interests of the large American cities within a small area and the consequent enormous appreciation of land values. This tendency toward concentration has been particularly noticeable in Chicago and New York, and we find the construction of tall buildings to have been the greatest in these cities. In a lesser degree, however, the same conditions prevail in other large American cities, and to-

day there are few cities of any size in this country which do not furnish one or more representative examples of the modern tall skeleton-constructed buildings. A census of such buildings would include, probably, the bulk of the expensive business structures erected during the last decade.

Roughly defined a skeleton-constructed building consists of a steel framework skeleton, with integument, flesh and viscera of masonry and wood, supported partly or wholly by the skeleton. A portion of the exterior walls only are self-supported and independent of the steel skeleton, and in the purely skeleton construction even these are carried wholly by the vertical frames. The design and construction of structural ironwork of the nature of these building skeletons, and on such a large scale, involve problems with which, as a rule, architects are not familiar, so that it has become necessary to employ engineers, who make a specialty of structural ironwork to prepare the general designs and calculations and to work out the details, as well as to superintend the foundations and erection, leaving to the architects mainly the design of the artistic features of the structure and the general arrangement of its interior. Considerations of wind, strains, variations of loading, facility of erection and the combination of strength and economy make it of the utmost importance that details of high buildings should be carefully designed by competent men, and that all the work should be put together in a thoroughly first-class manner.

Foundations.—The first important work of the engineer in designing a tall building is to secure an adequate foundation. As will be readily appreciated the weight imposed upon a small area of ground is in most cases enormous. The Park Row Syndicate building, in New York, for example, is estimated to weigh 18,000 tons, while it occupies a ground area of about 150x100 ft. The character of the foundation best designed to support such loads depends upon the nature of the foundation bed. In soft soil, where the underlying rock is at too great depths to be reached, either piles, or what are commonly called "floating" foundations are generally employed.

The "floating" foundation has been chiefly used in Chicago, where the foundation bed underlying the business district consists of from 12 ft. to 15 ft. of moderately firm soil overlying a much softer clay, from 40 ft. to 50 ft. deep. It is made of I-beams, or railway rails, laid cobhouse fashion, with the alternate layers of beams of lessening length toward the top, and all the interstices filled with cement concrete. By this construction a sort of raft-like structure is formed which distributes the load over a large area of the soft soil. Generally a separate "raft" is constructed to carry the weight of each column, but sometimes two or three columns rest on a single large raft. These rafts gradually settle, as much as several inches in certain instances, and provision is made for this settlement by building the whole structure several inches higher than it is finally intended to remain. To provide for the unequal settlement of different "rafts" an adjusting device has in a few instances been constructed at the foot of each column, by which it can be lengthened just the amount desired to compensate for the inequality.

Where piles are used they are generally driven in clusters and capped with concrete, each cluster carrying one or more columns. The piles are driven to hard soil. Another application of piles which has been employed, but not often, is to compress the soft soil of the foundation area by driving numerous piles close together all over it. The columns rest on caps or footings of concrete or masonry placed at suitable points on the bed of solidified earth and piles.

In New York, where bed rock can be reached and where the tall buildings are taller and heavier than in other cities, pneumatic caisson foundations are extensively used, and are sunk to the rock. These caissons are made of steel or wood, and are hollow boxes or cylinders with their single open end placed downward. One caisson may carry a single or several columns. It is placed over the proper site and then men are sent inside through traps in the top, who excavate the earth and pass it out through the traps in buckets handled by derricks or other forms of hoisting devices. As the earth is removed the caisson or box sinks deeper and deeper, it being loaded on top and provided with sharp cutting edges to facilitate the downward motion. As the caisson sinks it is built up on top with additional hollow sections of metal or wood until finally, when bed rock is reached by the cutting edges there remains a steel or timber-lined well from the surface to the rock bed. This well is then filled with masonry or concrete or both, and the necessary capping and column bases fastened to its top. When a caisson has to be sunk below the water line, as is nearly always the case in New York, provisions have to be made to prevent the water from filling the hollow working chamber and stopping work. The usual one is to make the working chamber air tight and to force air into it until the air pressure inside is great enough to counterbalance the pressure from the outside. Suitable openings, called air locks permit the passage of workmen and material to and from the working chamber without destroying the air pressure. Pneumatic caissons sunk to bed rock make perhaps the most perfect of all forms of tall building foundations.

A common construction is not to place the columns directly on the foundations thus

constructed, but to carry them on heavy girders, which rest on the foundations like a bridge truss upon the masonry piers and abutments of a bridge. This construction is designed chiefly to carry the exterior wall columns. These being located almost at the extreme outer perimeter of the building walls cannot always be supported by individual caissons, pile clusters, etc., since the latter cannot be constructed without interfering with the foundations of adjacent buildings. By using the girder the caissons, pile clusters, etc., can be set inside the outer perimeter of the building and the wall columns carried by a cantilever arm of the girder, projecting bracket-like over the outer edge of the caisson.

The allowable maximum load on different soils is stipulated by the building laws of Chicago as 3,500 lbs. per sq. ft. for clay; 3,000 lbs. per sq. ft. for mixed sand and clay, and 4,000 lbs. per sq. ft. for dry sand.

Columns.—Built up columns of steel are employed almost entirely in tall building construction, columns of cast iron being regarded as unreliable. These columns are made up at the mills in lengths of one and two stories and have sections of various forms, generally approximately rectangular or H-shaped. The different lengths are connected by rivets or bolts at the site of the building and form columns extending from the foundations to the roof and of constantly decreasing size upwards. At the floor levels the columns have fastened to them brackets of various forms to which are attached the interior floor girders and the exterior wall girders. Each column is of such size that it will carry safely the portion of the total level allotted to it, which is accurately calculated by the designing engineers. So important is great care in leveling columns regarded that each city has passed laws regulating the maximum allowable weight which columns of different sizes may be made to carry. The bottom sections of some of the columns in the American Tract Society building, in New York, are $39 \times 18\frac{7}{8}$ ins., and still larger columns were used in the Park Row Syndicate building, in the same city.

Floor Framing.—The floor framing is made up of the floor girders attached to the columns, as previously noted, and of floor beams attached by brackets to the floor girders. These floor beams are spaced from 4 ft. to 6 ft. apart, and are filled in with arches of fire-proof material (see paragraph Fire-proofing). The floor girders are generally plate girders made up of plates and angles riveted together to form an L-beam section, but the floor beams are usually rolled steel L-beams of one piece.

Wind Bracing.—The great height and area of exposure of tall buildings often make desirable some special provision to enable them to resist movement under high winds. There are various forms of wind-bracing for this purpose. Generally, however, the mass and weight of the building is a pretty efficient safe-guard against any danger from wind pressure. Naturally, too, the need of wind-bracing is greater in very tall, narrow buildings than in buildings covering a large ground area. In the Old Colony building, of Chicago, a series of very strong steel arched portals were carried across the building at several points, these portals being sprung between the columns at each floor, and forming a strong diaphragm to resist transverse motion. In other similar buildings the outside wall girders connecting the wall columns are made very deep and heavy, to give the structure extra rigidity against wind pressure. In still other cases diagonal cross bracing has been used between selected lines of columns. Various other forms of wind-bracing have been employed in individual cases.

Exterior Walls.—The character of the exterior walls employed in tall buildings depends upon whether the wall is exposed to view or not. Generally the front walls are of stone, terra cotta, or brick architecturally embellished to present as pleasing an aspect as may be. The party or division walls, which are concealed from view, are plain brick or terra cotta construction. Sometimes the entire front wall is self-supporting, or its lower stories are, and at other times it is carried by the steel frame. The party or division walls are never likely to be carried entirely by the steel frames. Where the wall is carried by the frame that for each story is carried by the outside wall girders of that story and is so entirely independent that it may be removed, leaving the walls of the stories above and below intact. The carrying of the walls by the frame-work makes it desirable that they should be as light as possible, and for this reason they are, in many cases, simply a veneering or skin of terra cotta.

Fire-Proofing.—The fire-proofing of the modern tall building is largely structural, that is it forms a part of the building structure itself and is not merely a protective coating. As already stated the floors are made of arches of fire-proof material sprung between the floor beams. The materials used for floor arches are: Burnt clay, hollow tile blocks formed to bind together like the stories in an arch ring and laid with joints of cement mortar; monolithic concrete arches, generally with a wire mesh, rods, straps or some other form of metal embedded in the concrete to increase their strength; and plaster of Paris compositions in blocks like tile or in monolithic masses like concrete, the latter generally with embedded metal skeletons. These materials give ample strength with light weight and are employed for that reason, as well as for their fire-resisting qualities, and the ease with which they may be put into the struc-

ture. The floor arches are so constructed as to bury, and thus protect the floor beams from heat. Columns are fire-proof with specially shaped blocks or monolithic masses of the same materials, and these materials, in special forms, are also used for partitions and in other places. The plastering and finish cover the fire-proofing and hide it from view.

Fire-proofing, however, constitutes but one feature of fire protection for tall buildings, which includes metal shutters closing the outside windows against the entrance of fire from a neighboring building, which is burning; water pipes extending from story to story and provided with pumps in the basement, and lines of these on each floor; and various devices, such as water buckets, chemical extinguishers, hand grenades, etc., for extinguishing incipient fires, and others for aiding firemen to reach and battle with the flames. The most common fault in the fire protection of tall buildings is rather the neglect to provide these various devices than the failure to employ inadequate structural fire-proofing.

Mechanical Plant.—The mechanical plant of the modern tall building is quite extensive and is one of its most important features. Space forbids any detailed mention, but some idea of the variety and extent of this plant is furnished by naming the principal mechanical devices which enter into the operation of an up-to-date tall building. These are: The elevator system, either electric or hydraulic, with the power pumps, motors, piping, safety devices, signal systems, etc., which enter into its operation; the steam heating plant; the drinking water supply plant often including a refrigerating plant for cooling the water; the regular toilet water supply; the electric lighting plant with generators, switch board, wiring, etc.; the private telephone system, the boiler and engine plant, which supplies power to all the other devices, including a specially powerful pump for fire protection. Not all these devices are found in every building, but the principal ones are, and in some cases, the mechanical aids are carried to a still greater extent.

Erection.—There is nothing more wonderful, perhaps, in connection with tall buildings construction than the rapidity with which they are erected. It is not unusual for a 25-story structure to be erected complete in 12 months. The Fisher building, in Chicago, 70½x100 ft. in ground area, and 235 ft. high, containing 18 stories and an attic, was erected in six and a half months. The steel frame for the 14-story Reliance building, in Chicago, was erected in two weeks. The Manhattan Life building was erected in thirteen and two-thirds months, the time being divided as follows: Foundations, five and two-thirds months; superstructure, eight months; the roof, or 18th tier of beams was reached in exactly three months from the time when the foundations were ready.

TANTALUM RADIATIONS. See PHYSICS (paragraph Becquerel Rays).

TARIFF OF THE UNITED STATES. The report of the Secretary of the Treasury, Lyman J. Gage, submitted to Congress on December 6, 1898, declared that domestic industries had been greatly benefited by the tariff act of 1897. It is certain that while our exports to foreign countries showed a remarkable increase over all previous years, the imports decreased. See article UNITED STATES (paragraph Commerce). The Secretary's favorable view of the matter was no doubt influenced by this fact, since the total revenue from the tariff for the fiscal year ending June 30, 1898, was only \$149,575,062, but it should be noted that the comparatively small receipts which followed the passage of the act gave no test of its revenue-yielding quality since importers, anticipating the passage of the act, laid in large stocks of merchandise before it came into operation. The Secretary reinforces his view in regard to the efficacy of the tariff as a revenue measure by the fact that the receipts from customs during the months of July, August, September, and October, 1898 amounted to \$62,776,080, an excess of \$4,633,026 over the receipts for a similar period in any year since 1892. The Secretary announced that commercial reciprocity had been entered into between the United States and France under the provisions of the Dingley Tariff Act, and that negotiations looking to a similar end were in progress with other countries. Early in the year 1898, the hope of securing commercial reciprocity between the United States and Germany was deferred by the retaliatory tariff measures adopted by the latter country. The Dingley law specifies certain commodities in regard to which reciprocity may be adopted, but it also allows a 20 per cent. reduction of duties if the commercial interests of the United States can be subserved thereby. Negotiations looking to reciprocal concessions between the United States and Germany were fruitless and for a time were suspended. In February, 1898, a Prussian decree prohibited the importation into Germany of all kinds of American fresh fruits, but upon the protest of the United States ambassador this decree was modified, and the prohibition was limited to the importation of fresh plants and plant refuse. The ostensible ground of this prohibitory decree was the need of protecting German fruits from a pest which was thought to have infested the American product, but the measure seemed to fit in so well with the Agrarian demands for retaliation against the American tariff that in the United States there was some doubt of the sincerity of this

defense. It was also said that the Prussian government levied higher charges upon the shipment of American pitch pine than upon that product when imported from other countries.

The policy of excluding certain American food products was followed also by Austria and Switzerland. With France the treaty of reciprocity was concluded in accordance with the provisions of the Dingley Tariff Act, and was proclaimed by President McKinley on May 30. Negotiations had been going on since October in the previous year. The chief points in the treaty were that the United States should reduce the tariff on a certain list of articles including argols, brandies, wine, vermouth and works of art, by about 20 per cent. in return for a 50 per cent. reduction in the French tariff in the case of meat, and of 37½ per cent. on lard compounds, and the placing of the minimum rate on fruit and lumber. The Western industries of fruit culture and lumbering were the ones to benefit especially from the French concessions.

TASCHENBERG, PROFESSOR ERNST LUDWIG, German entomologist, died at Halle, January 20, 1898. He was born at Naumburg in 1818; was educated at the Universities of Leipzig and Berlin, and then taught mathematics until 1856, when he was appointed inspector of the Zoölogical Museum at Halle. He wrote a number of books, the best known of which are of practical value to the horticulturist; among these works are: *Entomologie für Gärtner*, *Praktische Insectenkunde*, and *Was da kriecht und fliegt*, etc.

TASCHEREAU, ELZEAR ALEXANDRE, Cardinal and Archbishop of Quebec, died in Quebec, April 12, 1898. He was the great grandson of Thomas Jacques Taschereau, who emigrated from Touraine to Canada in the first half of the last century, and who, in 1746, was appointed Seigneur of Sainte Marie. At least three members of the family in the present century have sat on the judicial bench of Canada. Elzéar Alexandre was born at Ste. Marie de la Beauce, about thirty miles from Quebec, February 17, 1820. After finishing the course of study at the Quebec Seminary, he passed a year in Rome and received the tonsure in 1838. Having returned to Quebec, he was ordained to the priesthood, September 13, 1842, but since he was chiefly engaged in educational work he did not assume parochial duties until he became a bishop. After his ordination he became professor of mental and moral philosophy, and superior in the Seminary of Quebec, in which position he remained until 1854, when he went to Rome as a delegate to secure the Pope's ratification for the decrees of a provincial council. He passed two years in Rome, where he received the degree of Doctor of Canon Law, and returning to Quebec was appointed to the directorship of the Petit Seminaire, and in 1859 became director of the Grand Seminaire, becoming superior of this institution in the following year, and rector of Laval University, in which he had taken a chair of canon law in 1856. In 1870 he was a member of the famous Œcumenical Council at Rome, which decreed the *ex cathedrâ* infallibility of the Pope. The same year he was made administrator of the Quebec diocese, and on March 19, 1871, he was consecrated by Archbishop Lynch, of Toronto. Archbishop of Quebec, the see having been made vacant by the death of the previous incumbent. He was the first Canadian to be made a cardinal and received his appointment from the Pope July 21, 1886. The only non-ecclesiastical office held by Taschereau was that of member of the Council of Public Instruction for the Province of Quebec.

TASMANIA, BRITISH COLONY OF, is a large island in the South Pacific, lying to the south of Australia, from which it is separated by Bass's Strait. It has an area, including the adjacent islands, of about 26,215 sq. m., and with Macquarie, of 26,385 sq. m. Its population in 1891 was 146,667 (according to a later estimate 175,000). Its capital is Hobart, with a population in 1891 of 24,905, but a later estimate places it at 29,375. Agriculture and the raising of live-stock are the main occupations. Among minerals, iron ore, tin, copper, galena and coal are found.

In 1898, there were 242,241 acres under crop; the number of horses in the colony was 29,898; of cattle, 157,486; and of sheep, 1,588,611. In 1897 the exports amounted to £1,744,461 and the imports were £1,367,608. In 1898 the yield of wheat was 1,668,341 bushels; of oats, 1,102,285 bushels; of potatoes, 49,124 bushels; hay, 78,849 tons. The revenue for the year 1897 was £845,020, and the expenditure, £785,026. The government of the colony is administered by a governor appointed by the crown and a legislative council of 18 members, chosen for six years, and a house of assembly of 37 members, chosen for three years. The Governor in 1898 was Viscount Gormanston.

TASTE, SENSE OF. See PSYCHOLOGY, EXPERIMENTAL (paragraph University of Iowa).

TAXONOMY (OF PLANTS). See BOTANY (paragraph Systematic Botany).

TCHERNAIEFF, MICHAEL GREGOROVITCH, the Russian conqueror of Tashkend, died August 17, 1898. He was born October 24, 1828, and entered the military service in 1847. He distinguished himself in the Crimean War, attaining the rank of a General of Infantry, and at its close became Chief of Staff of a Division in Poland.

In October, 1864, after several years of campaigning against the tribesmen, he took Tchemkend by assault, and although disobeying orders, captured Tashkend the following June. This did much to extend Russian dominion in Central Asia, but Tcherniaieff was recalled to St. Petersburg; he retired temporarily from military service. In 1874 he became the recognized editor of the *Ruski Mir*, a journal devoted to Slav interests. His active military career ended in 1876, when the Turks defeated the Servian army, of which he had been appointed Generalissimo. In 1879, however, he attempted in Roumelia to organize a Bulgarian uprising, but was arrested and sent back to Russia. He was appointed in 1882 Governor-General of Turkestan, but his aggressive policy imperilling the relations of Russia and England led to his recall from Tashkend in 1884. Upon reaching St. Petersburg he became a member of the Council of War; in 1886 he was removed on account of imprudent publications, but in 1890 was reinstated.

TELEGRAPHING WITHOUT WIRES. See PHYSICS (paragraph Wireless Telegraphy).

TENNESSEE, a central Southern State, has an area of 42,050 sq. m. Capital, Nashville.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 76,467,742 bushels, value, \$22,175,645; wheat, 13,980,080, \$9,366,654; oats, 6,755,038, \$1,891,411; barley, 34,812, \$19,495; rye, 138,736, \$73,530; buckwheat, 21,546, \$11,204; potatoes, 1,427,556, \$813,707; hay, 414,798 tons, \$3,940,581; and cotton (season of 1897-8), 268,635 bales, \$7,713,693—total value, \$46,005,920. The State ranked tenth in the production of corn. Live-stock comprised, horses, 317,601; mules, 151,265; milch cows, 254,675; other cattle, 322,293; sheep, 286,063; and swine, 1,570,154—total head, 2,902,051.

Industries.—The cotton crop of 1897-98 was 268,635 bales, worth \$7,713,693, from 967,077 acres. There were 29 cotton mills in operation, employing 158,990 spindles, and buying 35,773 bales of cotton for their work. In coal, there was a production in 1897 of 2,888,849 short tons, spot value, \$2,329,534, from 45 mines, the output showing a steady increase since 1893 and being the largest on record for the State. Quarry products had a value of \$555,728, marble (\$441,954) showing an increase and continuing to be used principally for interior decoration. Iron mines yielded 604,497 long tons, value, \$479,485, of which 343,947 tons were brown and 260,550 red hematite. A remarkable advance in the recently established phosphate industry is noted. Operations are being carried on in three separate and distinct fields, the Mt. Pleasant, Blue Rock, and Perry county. The production in 1897 was 128,723 long tons, value, \$193,115, against 26,157 tons, value, \$57,370, in 1896. In the petroleum industry, early expectations have not been realized, and large oil companies have surrendered thousands of acres of leases to the original owners. There was only one producing well in the State in 1897, and that was yielding about 17 barrels daily, but its location prevented profitable marketing. The coking industry had 15 operating plants, with 1,948 ovens, which used 667,996 short tons of coal, and produced 368,769 short tons of coke, value, \$667,656; and the clay industry with 116 plants produced brick and tile worth \$571,923 and other articles worth \$40,370. During the summer of 1898 all the coal mines in the famous Jellico district were sold to an English syndicate. They comprised about 25,000 acres, employed 3,000 persons, and had an annual output of 500,000 tons. In the fiscal year ending June 30, 1898, the taxable manufactures of the State yielded the Federal government \$1,286,885 in internal revenue.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise at the delivery ports of Memphis and Nashville aggregated in value \$85,685, against \$131,997 in 1897 and \$150,701 in 1896. There are no direct exports.

Transportation.—On Jan. 1, 1898, the length of all railroads in the State, reckoned as single track, was 3,106.82 miles, of which 28 miles were constructed in the previous year.

Banks.—On Oct. 31, 1898, there were 49 national banks in operation and 29 in liquidation. The active capital aggregated \$8,035,000; circulation, \$1,924,907; deposits, \$19,039,494; reserve, \$6,261,579. The State banks, June 30, 1898, numbered 59, and had capital, \$2,789,520; deposits, \$6,004,081; resources, \$9,628,036; and stock savings banks, 6, with capital, \$355,000; deposits, \$2,144,136; resources, \$2,939,918. In the year ending Sept. 30, 1898, the exchanges at the United States clearing houses at Memphis, Nashville, and Chattanooga, aggregated \$185,605,092, an increase of \$24,646,641 in a year.

Education.—The last report available at the time of writing was for the school-year 1895-96, and showed, school population, 720,923; enrollment, 481,585; attendance, 338,176; school houses, 7,152; teachers, 9,135; value of school property, \$3,133,789; and expenditures, \$1,690,750, including \$1,342,870 for teachers' salaries. The percentages of enrollment by races were, white, 70.63; colored, 68.57. For higher education there were 97 public high schools; 113 private secondary schools; 16 private normal schools; 24 colleges and universities, co-educational and for men only, with 311 pro-

fessors and instructors, 4,845 students, and \$473,833 income; 13 colleges for women, with 202 instructors, 1,528 students, and \$156,800 income; and 8 theological, 6 law, and 9 medical schools. The agricultural and mechanical department of the State University, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the various higher institutions, the libraries contained an aggregate of 287,950 volumes. Periodicals in 1898 numbered 295; dailies, 19; weeklies, 218; monthlies, 41.

Finances.—The assessed valuations for 1897 were, acres, \$162,920,056; town lots, \$111,732,170; other property, \$36,720,503—total, \$311,372,729; tax rate, \$3 per \$1,000. The aggregate valuation was the lowest in many years. In September, 1898, the total interest-bearing debt was \$16,454,800, of which \$13,709,800 was in the new settlement bonds due in 1913. The estimated sum of bonds yet to be funded was \$840,000. At the close of 1898 the deficit in the State Treasury for the two years preceding was \$811,180.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 1,935,000. Local estimates gave Memphis, 110,000; Nashville, 100,000; Chattanooga, 50,000; Knoxville, 45,000; Jackson, 16,000; Clarksville, 9,000.

Politics and Elections.—The Democratic convention, held in June, indorsed the Chicago platform of 1896 on the money question, approved the war against Spain, and recognized the Monroe Doctrine as a cardinal tenet of the Democratic party. Benton McMillan was nominated for Governor by acclamation. The Republican convention heartily indorsed the St. Louis platform of 1896 on national issues and congratulated the country on the prosperity resulting from the Dingley tariff bill, and the maintenance of the gold standard. In the belief that trade follows the flag, it declared in favor of annexing Porto Rico and all the West Indian Islands, "and that if an independent government cannot be established in Cuba, it be ultimately annexed by the free consent of the people of the island." It favored "such control of the Philippines and other islands as shall secure to the United States the trade and commerce of those islands and good government to their people." It also demanded the construction of the Nicaraguan Canal under American control.

In the Congressional and State elections, the vote was light. The Democrats won a decisive victory, electing Mr. McMillan Governor by a plurality of 33,029. They also elected eight out of ten Congressional Representatives, and 105 members of the State legislature; giving them a majority of 78 on joint ballot.

National Representatives and State Officers.—Tennessee's Representatives are: Walter P. Brownlow (Rep.), from Jonesboro; Henry R. Gibson (Rep.), from Knoxville; John A. Moon (Dem.), from Chattanooga; C. A. Snodgrass (Dem.), from Crossville; John W. Gaines (Dem.), from Nashville; John D. Richardson (Dem.), from Murfreesboro; N. N. Cox (Dem.), from Franklin; Thetus W. Simms (Dem.), from Linden; Rice A. Pierce (Dem.), Union City, and E. W. Carmack (Dem.), from Memphis. Senators: Thomas B. Turley (Dem.), from Memphis, and a Democrat. State officers: Benton McMillin, Governor; William S. Morgan, Secretary; E. B. Craig, Treasurer; John T. Essery, Commissioner of Agriculture; Price Thomas, Superintendent of Public Instruction; James A. Harris, Comptroller; Charles Sykes, Adjutant-General; and G. W. Pickle, Attorney-General. All are Democrats. Chief Justice, David L. Snodgrass; Associates, W. C. Caldwell, John S. Wilkes, W. K. McAllister, and W. D. Beard; Court of Chancery Appeals, Justices, M. M. Neil, S. F. Wilson, R. M. Barton; and Clerk, A. W. McMillin. All are Democrats. There are 105 Democrats and 27 Republicans in the State legislature.

TENNEY, ASA W., Judge of the United States District Court in New York, died in New York City, December 10, 1897. He was born in Dalton, New Hampshire, in 1833; was graduated at Dartmouth College with the class of 1859. For about twelve years he was United States District Attorney for the eastern district of New York, and in September, 1897, was appointed to the bench.

TENNIS. Since the advent of bicycling and golf in the United States, there has been a marked and steady decline in the popularity of tennis, though up to the present year the existence of a body of well-seasoned players who have annually contended for the National Championship at Newport, has always created considerable interest in that event. During the season of 1898, however, several of the crack players, among them R. D. Wrenn, the 1897 champion, and W. L. Larned, were absent with the army, and many of those who played at Newport were comparatively unknown to the public. Thus, much of the usual interest was lacking. Malcolm D. Whitman of the Longwood Cricket Club carried off first honors at the National Championship Lawn Tennis Tournament held at Newport Casino, August 16th to 24th, by defeating D. F. Davis in the finals by a score of 6-2, 6-2, 6-1. As R. D. Wrenn did not appear to defend his title of National Champion, Whitman holds that title for the year 1898. In the championship doubles H. Ward and D. F. Davis defeated G. F. Wrenn, Jr. and M. D. Whitman in a well-fought contest by the score of 6-2, 6-4, 6-4. Ward and Davis, however, were defeated by L. E. Ware and G. P. Sheldon, Jr., who thus

successfully retained the championship they had won in 1897. Five sets were played and the score was, 1-6, 7-5, 6-4, 4-6, 7-5.

TENNYSON, FREDERICK, the oldest brother of Alfred, Lord Tennyson, died Feb. 28, 1898. Born in 1807, he was educated at Eton and at Trinity College, Cambridge. He was a poet of some ability, having in early life, like his brothers Alfred and Charles, shown some power in versification, and in 1828 he won a medal for a Greek ode written in Sapphic metre. His more important publications are *Days and Hours*, *Daphne and Other Poems*, *The Isles of Greece (Sappho and Alcæus)*, and *Poems of the Day and Year*.

TERRISS, WILLIAM (WILLIAM CHARLES JAMES LEWIN), prominent actor, was murdered by a madman at the entrance of the Adelphi Theatre, London, December 16, 1897. He was born in 1852; was educated privately under his uncle, George Grote, the Greek historian, and expected to enter the navy, but in 1871 took up the theatrical profession and for many seasons appeared at Drury Lane. For seven seasons he appeared with Sir Henry Irving and Ellen Terry and at one time had a run at the Lyceum for 260 nights as "Romeo" with Mary Anderson (Signora Antonio de Navarro). He made four visits to America, twice with Sir Henry Irving and twice with his own company. He was remarkable both in creations of his own and in re-viving well-known characters. Among his most successful characterizations are "Henry II" (in *Becket*), "Squire Thornton" (in the *Vicar of Wakefield*), "Henry VIII," and in fact most of the leading Shakespearean characters.

TERTIARY. The Tertiary formations underlie great areas in the United States, especially in the West and the South, including both marine deposits and those formed in extensive lakes, but the correlation of the different American formations with each other as well as with foreign ones has been a matter of considerable difficulty. A classification has been published during the past year by the United States Geological Survey, in which the column of Tertiary horizons or beds in the region of the Gulf States is taken as a standard, while with it are compared the Tertiary areas of the Atlantic States and Antilles, those of the western interior lake basins which contain the remains of gigantic vertebrates, and those of the Pacific coast, the equivalents for Western Europe being given in addition. The main epochs and stages, or divisions of the second and third order which are recognized in all the areas are:

Epochs.	Stages.
Pleistocene.	
Pliocene	
Miocene.	
Oligocene.....	{ Upper or Chipolan.
	{ Lower or Vicksburgian.
	{ Jacksonian.
Eocene.....	{ Claibornian.
	{ Chickasawan.
	{ Midwayan.

TETANUS. See SERUM THERAPY.

TEXAS, a southwestern State, has an area of 265,780 sq. m. Capital, Austin.

Mineralogy.—The most marked feature of recent mineral development is the increase in the petroleum industry. In 1895, Bexar, the only oil-producing county in the State, yielded 50 barrels; in 1897, Navarro, Jefferson, Hardin, and Bexar produced 65,975 barrels, valued at \$37,662, Navarro county yielding the largest amount. The coal output in 1897 was 639,341 short tons, spot value, \$972,323, showing a steady increase since 1891, owing in large measure to the development of lignite fields in Medina, Milan, Robertson, and Burleson counties. Of the precious metals, gold had a product of 358 fine ounces, value, \$7,400, and silver, 404,700 fine ounces, coining value, \$523,249, a decrease in each. Copper, once an important production of the State, is no longer classed among its economic properties. Quarrying had an output worth \$90,788, including limestone, \$57,258; sandstone, \$30,030. Iron mining yielded 13,588 long tons, worth \$10,870, all brown hematite; cement yielded 7,778 barrels, worth \$23,334; and asphaltum had a product of 65 short tons, all in Montague county. For the clay industry, see paragraph on Manufactures.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 105,336,700 bushels, value, \$35,814,478; wheat, 9,348,464, \$6,356,956; oats, 21,121,630, \$5,914,056; barley, 41,480, \$20,740; rye, 49,116, \$34,872; potatoes, 1,047,150, \$900,549; and hay, 471,448, \$2,757,971—total value, \$51,799,622. The cotton crop in the season of 1897-98 was 2,822,408 bales, valued at \$86,298,665, from 7,164,175 acres. The State led all the others in the production of cotton and was seventh in corn. Live-stock comprised, horses, 1,137,015; mules, 265,880; milch cows, 700,802; other cattle, 4,533,897; sheep, 2,543,917; and swine, 2,684,987—

total head, 11,866,498. The State led all the others in the number of live-stock and of horses and cattle, and was second in swine and fourth in sheep.

Manufactures.—Purchases of cotton for local mill consumption amounted to 14,312 bales. There were four cotton mills in operation, employing 46,936 spindles. The clay-working industries had a combined output from 184 plants valued at \$1,197,039, of which brick and tile represented \$1,134,829 and pottery products, \$62,210. Various taxable manufactures yielded the Federal government \$523,799 in the fiscal year 1897-98. Tobacco manufactories had a product of 11,809,837 cigars, 120,000 cigarettes, 1,732 pounds of plug, and 59,604 pounds of smoking tobacco. There were 17 distilleries of all kinds in operation, and 10,447 gallons of corn whiskey and 322,216 barrels of fermented liquors were produced.

Commerce.—During the fiscal year ending June 30, 1898, the imports of merchandise at the ports of Brazos de Santiago, Corpus Christi, Galveston, Paso del Norte, and Saluria, aggregated in value \$4,473,904; exports, \$79,375,289, a slight increase in imports and one of more than \$8,000,000 in exports. The movement of gold and silver was, imports, \$11,800,996; exports, \$1,187,395, a large increase in each. The total foreign trade of the year was \$96,837,584, against \$82,798,032 in 1896-97, \$59,910,724 in 1895-96, and \$58,004,441 in 1894-95.

Railroads.—The State ranks third in steam railroad mileage, having a total on Jan. 1, 1898, of 9,579.64, of which 86.50 miles were constructed during the previous year. The long pending controversies between the State and the Southern Pacific Company over rate discriminations were compromised in 1897 and the company paid the State \$25,000.

Banks.—On Oct. 31, 1898, there were 197 national banks in operation and 73 in liquidation. The active capital aggregated \$19,415,000; circulation, \$5,464,849; deposits, \$37,979,419; reserve, \$12,651,914. Three State banks had, June 30, 1898, capital, \$400,000; deposits, \$502,170; resources, \$1,008,946; 20 private banks, capital, \$764,041; deposits, \$1,068,077; resources, \$2,282,377; and one stock savings bank, capital, \$100,000; deposits, \$374,525; resources, \$942,586. In the year ending Sept. 20, 1898, the exchanges at the United States clearing houses at Galveston, Houston, and Fort Worth, aggregated \$308,049,935, an increase of \$46,307,158.

Education.—The school population was reported at 718,664 in 1895 and 775,933 in 1897. The last detailed report available at the time of writing was for 1896, and showed, enrollment in the public schools, 616,568; daily attendance, 440,249; public school houses, 10,126; teachers, 13,217; public school property valued at \$7,289,184; and expenditures, \$3,996,778, including \$3,404,054 for teachers' salaries. The percentages of enrollment by races were, white, 72.68; colored, 66.84. For higher education there were 181 public high schools; 80 private secondary schools; 2 public and 8 private normal schools; 15 colleges and universities, co-educational and for men only, with 221 professors and instructors, 3,155 students, and \$253,079 income; 3 colleges for women, with 30 instructors, 311 students, and \$43,559 income; and 2 theological, 2 law, and 2 medical schools. The higher institutions contained a total of 176,757 volumes in their libraries. Of the total State debt, Sept. 1, 1898, the public school fund held bonds for \$2,173,100; university fund, \$578,540; agricultural and mechanical college fund, \$209,000; blind asylum fund, \$111,500; deaf and dumb asylum fund, \$61,000; and orphan asylum fund, \$9,200—in all, \$3,142,340. In 1898 the periodicals numbered 753; dailies, 62; weeklies, 622; monthlies, 48.

Finances.—The assessed valuations for 1897 were, real estate, \$585,224,536; personal property, \$269,670,239—total, \$854,894,775; tax rate, \$3.80 per \$1,000. The total bonded debt, Sept. 1, 1898, was \$3,992,030, of which various State funds held \$3,254,040, leaving in the hands of individuals, \$737,990.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 2,842,000. Local censuses and estimates gave San Antonio, 65,000; Dallas, 63,176; Fort Worth, 30,000; Waco, 25,000; Sherman, 15,000; Corsicana, 11,500; Gainesville, 11,000; Waxahachie, 8,000; Brenham, 6,727; Greenville and Cuero, each, 6,000; and Belton, Bowie, Brownwood, Navasota, and Orange, each, 5,000.

Politics.—The Democratic State convention indorsed in every particular the platform of the National Democratic convention at Chicago, in 1896; denounced the Republican party for the passage of the Dingley tariff; and favored the carrying out of the spirit with which intervention was made in Cuba, insisting that the Cubans should be permitted to establish an independent government of their own; but in the event that the people of that island should afterward desire to be annexed to this country and the terms of annexation could be satisfactorily arranged between the two governments, we should annex Cuba as a part of the territory of the United States. The platform also affirmed faith in the Monroe Doctrine; favored the generous development of the American navy; opposed the annexation or continued retention of the Philippines or any territory in the Eastern Hemisphere; and favored the immediate construction of the Nicaragua Canal under the ownership and control of the United States. The convention nominated Joseph D. Sayers for Governor. The Republican platform affirmed allegiance to the St. Louis platform of 1896; indorsed the President

and administration; congratulated the army and navy; favored the immediate construction of the Nicaragua Canal and an increase of the army and navy to carry out the plans of the government "with regard to the annexation of Porto Rico and other Spanish possessions, and the establishment of a stable government in the island of Cuba." It also approved the annexation of Hawaii as "an evidence of the determination of our Administration to carry into effect the Monroe Doctrine." After three days and nights of factional strife, however, the Republican convention adjourned without nominating a ticket. A large majority of the delegates, both white and black, were eager to name a straight Republican ticket, but the leaders refused.

Elections.—The members of the Republican party were instructed to vote for Sayers (Dem.), or Gibbs (Pop.), according to their personal preferences. The result was the election of Sayers by 153,000 plurality. The Democrats also carried nine out of the eleven seats in Congress, elected all their candidates for State offices and have a majority in the legislature of 137 on joint ballot. C. A. Culberson, the ex-Governor, was elected United States Senator to succeed Roger Q. Mills. The elections aroused bad blood in some localities. At Hubbard, Stevens county, four men were fatally hurt in an election quarrel, and two more were killed at Steuben, Hopkins county. A deputy sheriff and another man were dangerously wounded at Aubrey, Denton county; a father and son were killed at Sheffield, Trinity county; and many minor affrays occurred at various points on election issues.

National Representatives and State Officers.—The Representatives from Texas are: T. H. Ball, from Huntsville; S. B. Cooper, from Beaumont; R. C. DeGraffenreid, from Longview; John L. Sheppard, from Pittsburgh; J. W. Bailey, from Gainesville; R. E. Burke, from Dallas; R. L. Henry, from Waco; S. W. T. Lanham, from Weatherford; A. S. Burleson, from Austin; R. B. Hawley, from Galveston; Rudolph Kleberg, from Cuero; James L. Slayden, from San Antonio; and John H. Stephens, from Vernon. All but Hawley are Democrats. Senators: Horace Chilton (Dem.), from Tyler, and a Democrat. The State officers are: Joseph D. Sayers, Governor; J. N. Browning, Lieutenant-Governor; J. P. W. Madden, Secretary; J. W. Robbins, Treasurer; R. W. Finley, Comptroller; J. S. Kendall, Superintendent of Public Instruction; J. Johnson, Commissioner of Agriculture; W. H. Mabry, Adjutant-General; T. S. Smith, Attorney-General; and G. W. Finger, Commissioner of General Land Office. All are Democrats. Chief Justice, Reuben B. Gaines; Associates, Leroy G. Denman, and Thomas J. Brown; Clerk, Charles S. Morse. All are Democrats. The State legislature consists of 148 Democrats, 2 Republicans, 7 Populists, and 2 Independents.

THAYER, WILLIAM MAKEPEACE, clergyman and author, died at Franklin, Massachusetts, April 7, 1898. He was born in that town February 23, 1820; was graduated at Brown in 1843, studied theology, and entered the ministry. After a few years, however, he devoted himself to literary work. He was a member of the Massachusetts legislature in 1857 and in 1863. In 1860 he became secretary of the Massachusetts Temperance Alliance, a position which he held for many years. His writings were chiefly religious and juvenile. He made use of a conversational style in biographical writing. He was the editor of the *Boston Monthly* and *Mother's Assistant*. Many of his works have been translated into German, Italian, Swedish, and Hawaiian. In 1859 he published *The Bobbin Boy*; among his other works are: *The Pioneer Boy* (1863); *Youth's History of the Rebellion* (four vols. 1863-65); *Marvels of the New West* (1887); *From Log Cabin to the White House*, of which it is said that more than 300,000 copies have been sold; *From Pioneer Home to the White House*; *Tannery to the White House*.

THEATRE, GREEK. See ARCHÆOLOGY (paragraph Greece).

THEBES, EGYPT. See ARCHÆOLOGY.

THEORIES OF MATTER. See PHYSICS (paragraph Potential Matter, and Vortex Motion).

THEOSOPHICAL SOCIETY. See UNIVERSAL BROTHERHOOD.

THERMON. See ARCHÆOLOGY (paragraph Greece).

THIBET, a country of Central Asia. Little is known of its interior owing to the objection on the part of the natives to the visits of foreign travellers, but in the last few years explorers have entered the country and published accounts of their travels. The most noteworthy of these is Dr. Sven Hedin's work which appeared in 1898. (See the article CENTRAL ASIA.) The extreme elevation of the land has caused a portion of Thibet to be called the "Roof of the World." In 1894 Yatung on the Indian frontier was opened for trade.

TIENTSIN, a city of China situated at the junction of the Huer and Peiho rivers and about 80 miles distant from Pekin. It has a population of about 1,000,000. Attention was drawn to it in the year 1898 on account of the rapid march of improve-

ments there and especially in connection with the Imperial Chinese railway of which, in the summer of 1898, 320 miles had been constructed, 125 more being in process of construction. To illustrate the great improvements and the rapid growth which has taken place in Tientsin, it may be mentioned that the streets have been macadamized, trees planted, a water system has been introduced and gas works constructed; all of which has been accomplished by foreign enterprise. The Chinese authorities themselves, however, have entered into the spirit of these improvements and established there an Imperial military college, an Imperial university, arsenals, a mint and above all have nearly completed the great railway which is regarded as one of the most important enterprises in Northern China. Tientsin is the headquarters of a Chinese mining company, whose mines are at Tong Shan, 180 miles to the north of the city, and at Linsi. Their daily output of coal is said to be 15,000 tons and 700 tons respectively. The machinery for the mines was bought in England and Germany and the management of the undertaking is chiefly in the hands of British subjects. The annual foreign trade is estimated at \$42,250,000. The tonnage entered during the year 1897 was 663,737 and the tonnage cleared was 662,926. Of these totals the greater share was divided between the British and Chinese. While it was reported in 1898 that the trade with the United States was increasing, it was impossible to determine what portion of the imports came from this country since the larger part of the goods arrived via Shanghai and Hong-kong and were listed as native imports, and moreover the American producers do not follow the example of their commercial rivals in maintaining there their foreign agents. It was reported in 1898 that the Imperial Chinese railway was being gradually extended and would before long be completed to Niu-Chwang, which is one of the termini of the Russian railway.

THORIUM GAS MANTLES. Ernest Heintz shows that the incandescent mantles in use at the present time consist almost invariably of thoria and ceria, with traces of lime, and frequently small quantities of neofymia, yttria and zirconia. What Heintz has added to our knowledge is the fact that the greatest emissive power is gained by a mixture of 99 parts of thoria to 1 part of ceria, the emissive part of this mixture being fully ten times as great as that from the thoria alone. The substitution of any other of the rare earths for the ceria tends to diminish the emissive power of the thoria, and when present simultaneously with ceria in proportions up to one per cent, they in no way increase the luminous effect.

THORIUM RADIATIONS. See PHYSICS (paragraph Becquerel Rays).

THOMPSON, THOMAS L., California politician and diplomat, committed suicide at Santa Rosa, California, February 1, 1898. He was born at Charleston, West Virginia, in 1838; became a well-known publisher and editor in California, being connected with the business for nearly forty years. He was a member of Congress, 1887-89; Secretary of State for California for one term; and minister to Brazil during Mr. Cleveland's second administration.

TIN. No tin was produced in the United States in 1897 or in 1898, and none of the rumors of discoveries proved trustworthy, so that all the tin used in this country came from foreign sources, the important ones being the Malay Peninsula, China and India, with smaller amounts from Bolivia, and Australia.

TISZA, COUNT LUDWIG, Hungarian publicist, died at Budapest, January 26, 1898. He was a brother of Koloman Tisza, the well-known Hungarian statesman, and was born at Geszt, September 12, 1832. Count Tisza had also the title of Count von Szegedin, which was conferred upon him for his services in the restoration of Szegedin, on the river Theiss, after the inundation of 1879. He was vice-president of the Hungarian Council of Architecture, 1869, and two years later became minister of public works. In early life he was a Radical, but in 1875 joined the United Liberals.

TOGOLAND. Togoland is a colony of the German Empire, in West Africa, on the Gulf of Guinea, between the British Gold Coast on the west, and French Dahomey on the east, with an estimated area of 23,160 sq. m., and an estimated population of 2,500,000, of which, in 1897, 102 were Germans. The chief port is Lome, and among the other settlements are Togo, in the interior, with about 8,000 inhabitants, Little Popo, Porto Seguro and Bagida. On the coast the climate is unhealthful. In the interior the country is hilly and well watered, and contains stretches of forests and dry plains, but here and there are arable lands. It is inhabited for the most part by a branch of the Soudan negroes. The chief products of the soil are brought by the natives to the trading factories. These products include palm tree oil, nuts, copra, cocoanuts, gutta percha, and ivory. Coffee planting has been undertaken and there are some native industries, such as pottery, weaving, straw plaiting and wood-cutting. The trade is chiefly in palm oil, palm kernels, and gum. An import tax is imposed upon foreign goods, and the revenue comes mainly from customs. Efforts have been made to convert and civilize the natives through the missionary societies

established in the province. There is a native armed police force for the maintenance of order. Politically Togoland is a protectorate, governed by an Imperial Commissioner. The protectorate was proclaimed in 1884. For many years its limits toward the interior were not fixed, but in 1897 a convention was signed for the delimitation of the hinterland of Dahomey and Togoland respectively. By this Togoland gained a strip of coast and the fertile district of Sansanne Mangu, while France acquired the wide tract of Gunma, thereby establishing communication between Dahomey and the French Soudan, and hemming in German Togoland to the sea. This convention greatly simplified the conflicting claims in this region, and prepared the way for the Anglo-French agreement of 1898. See NIGER TERRITORIES.

TOMBS, EUCOLITHIC. See ARCHÆOLOGY (paragraph Italy).

TOMBS OF THE KINGS, THEBES, EGYPT. See ARCHÆOLOGY.

TOMBS, ROCK, OF PHRYGIA. See ARCHÆOLOGY (paragraph Asia Minor).

TOME, JACOB, founder of the Institute that bears his name, at Port Deposit, Maryland, died in that town March 16, 1898. He was born at Manheim, York county, Pennsylvania, August 13, 1810; received a common school education, settled in Port Deposit, and subsequently engaged in the lumber business at Marietta, Pennsylvania; later in life he also went into banking and amassed a large fortune. During the Civil War he was a strong Union man, and a prominent member of the Maryland Senate in 1864-66; at this time he rendered much useful service in rearranging the disordered finances of the State. In 1871 he was nominated for Governor, as a Republican, but was defeated by William Pinkney White. He declined the portfolio of the Treasury, offered him by President Grant. In 1898 he founded the institute at Port Deposit, which is entirely supported by his endowments, amounting in 1898 to \$3,000,000. In founding this school his aim was to give the children of the community and State the best and broadest education for the lives they were to lead. Instruction is given in the kindergarten and in the primary and grammar grades, and students are graduated at the end of a high school course; manual training and domestic science are accentuated. At the time of his death Mr. Tome was President of the following banks: Citizens' National, Washington; Cecil National, Port Deposit; Fredericksburg (Virginia) National, and Elkton (Maryland) National.

TONQUIN, or TONKING, is a French dependency, which with Anam, Cambodia and Cochin China, forms a part of French Indo-China (q. v.). It is bounded by China, the Gulf of Tonquin, Anam and the Shan States, with an area formerly placed at 34,740 sq. m., and an estimated population of 9,000,000, but including the region obtained by France from Siam in 1893, the area is about 122,000 sq. m., and the population about 12,000,000. Rice, sugar cane, cotton and tobacco, and various fruit trees are cultivated, the principal crop being rice. It is ruled by a French Resident under the Council of Indo-China, and there is a French army of occupation numbering about 19,000. The Superior Council of Indo-China advises as to the budget. The colony is not self-supporting. In the budget of 1898 the French government set apart the sum of 24,450 francs for the expenses of administration.

TOPELIUS, ZACHARIE, Finnish-Swedish writer and poet, died at Helsingfors, Finland, March 13, 1898. He was born at Kuddnas, January 14, 1818; he studied at Uleaborg and with the poet Runeberg and finally at the Helsingfors University. In 1852 he taught history at Wasa, and two years later was made professor of Finnish history at Helsingfors, becoming, in 1876, professor of general history. From this position he retired in 1878 to devote himself entirely to literature. Among his writings are: the volumes of lyrics, *Ljungblommer* (1845-54), *Sanger* (1860), *Nya blad* (1870), *Ljung* 1889; the dramas, *Efter femtio år* (1851), and *Regina von Emmeritz* (1854); novels, tales and children's books by which he won popularity,—*Fältskärens berättelser*, *Sagor*, *Läsning*, *Finland framställt i teckningar* (1845-52), *En resa i Finland* (1873). Many of the writings of M. Topelius have been widely read in Finland and Scandinavia, and some have been translated into German and English. His works are marked by their religious and patriotic sentiments and by their pathos, as well as their fresh and bright expression.

TORPEDO BOATS. These are not of recent origin, having made their first appearance during the American Civil War, from 1860 to 1865. At that time the boats were primitive affairs, generally improvised from steam launches or ordinary rowing boats, with a projecting spar carrying a torpedo on its end. Some time in the seventies the construction of separate steam torpedo boats was begun. Since that time European powers, principally England and France, have continued to construct and perfect this type of fighting vessel. Other countries have taken up the torpedo boat, and under the influence of this rivalry the size, speed and perfection of torpedo boats have developed to a wonderful degree. More recently the United States has begun the construction of a torpedo flotilla, and within a few years, if the present policy is continued, this country will be as well equipped as the uncertainties of this type of vessel warrant. The accompanying table gives the dimensions of the latest

United States torpedo boats. Development has brought about a type known as the sea-going torpedo boat—in other words, one capable of putting to sea, and capable of weathering the storms of the ocean. Such vessels are never less than 100 feet long and 50 tons displacement. To do the double duty of attacking an enemy, and guarding vessels of its own side certain requirements are necessary; an efficient torpedo armament; a gun armament sufficiently powerful for an attack upon other torpedo boats, high speed, sufficient coal capacity and good manœuvring qualities.

The armament of this type usually consists of three 18-inch torpedo tubes, and two or three rapid-fire machine guns. Speeds of from 21 to 25 knots are common, although of the 1,600 torpedo boats now possessed, building or projected by the nations of the world, only 260 have a speed of 25 knots or more. On the score of coal capacity ideas vary greatly. The present maximum limit seems to be sufficient coal to cruise from 3,500 to 4,000 miles at a rate of 10 knots on one coaling. They range from this figure all the way down to perhaps 800 or 900 miles.

Smaller torpedo boats are made for carrying on battleships, to be used in case of naval conflicts, reliance being placed upon the smoke or confusion of battle to permit their near approach to the enemy. This smaller type is also considered of service for coast and harbor defence. They must have all the equipments of the larger boats, with the additional requirement of least possible draught.

A third type of recent construction, is known as the torpedo boat destroyer, or cruiser. This is a natural outcome of the increasing number and size of the torpedo boats, their function being the attack and destruction of torpedo boats. They vary in size from boats 100 feet long to 245 feet, or even more. They are provided with heavy rapid-fire guns and also torpedo tubes. High speeds from 26 to 35 miles per hour are necessary, so that they may chase any torpedo boat they may fall in with. In reality they are nothing more than large torpedo boats. The following dimensions are those of the latest torpedo boat destroyers contracted for by the United States government and may be regarded as typical of the general class.

DIMENSIONS AND PARTICULARS.

Hull.

Length on load water-line (normal condition).....	175 ft. 0 in.
Beam at load water-line (normal condition)	17 ft. 0 in.
Draft (normal condition)	4 ft. 8 in.
Corresponding displacement in tons	165
Speed per hour in knots	26
I. H. P	3,000
Mean draft (with all stores, provisions, ammunition, and 70 tons of coal on board)	5 ft.8¼ in.
Corresponding displacement in tons	230

Armament.

3 3-pdr. S. A. R. F. guns.
3 short Whitehead central pivot torpedo tubes.

General Schedule of Weights.

	Full supply. Tons.	Normal supply (trial) Tons.
Hull and fittings	57.1	57.1
Ordnance weights	12.7	8.9
Equipment weights	3.2	3.2
Ship's outfit	7.2	6.4
Machinery, propelling, with water	79.8	79.8
Coal	70.0	10.0
Total	230.0	165.4

DIMENSIONS AND PARTICULARS.

Hull.

Length on load water-line (normal condition)	245 ft. 0 in.
Beam at load water-line (normal condition).....	23 ft. 0 in.
Draft (normal condition).....	6 ft. 6 in.
Corresponding displacement (in tons)	420
Speed per hour in knots	28
I. H. P	8,000
Mean draft, with all stores, provisions, ammunition, and 212.3 tons of coal on board	8 ft.4 16 in.
Corresponding displacement in tons	630.9

Armament.

2 12-pdr. R. F. guns.
5 6-pdr. S. A. R. F. guns.
2 long Whitehead central pivot torpedo tubes.

General Schedule of Weights.

	Full supply. Tons.	Normal supply (trial.) Tons.
Hull and fittings	174.9	174.9
Ordnance weights	23.6	15.0
Equipment weights	7.4	5.0
Ship's outfit	23.6	11.0
Machinery, propelling, with water	189.1	189.1
Coal	212.3	25.0
Total	630.9	420.0

TRACT SOCIETY, AMERICAN, founded in 1825, headquarters 10 E. 23rd st., New York. President, Gen. O. O. Howard; Secretaries, W. W. Rand and George L. Shearer. In 73 years this society has distributed 474,738,412 books, pamphlets, and tracts.

TRADES UNIONS, CONGRESS OF. In 1898 the thirty-first annual Congress of Trades Unions was held at Bristol England. It was attended by 450 delegates, including representatives from the United States and Japan, representing, it is said, 1,250,000 working men. The progress of Trade Unionism is illustrated by the fact that at the annual meeting held in the same city twenty years before, the delegates numbered 136, and represented less than one-half of this number of workingmen. The Congress of 1898 voted the usual programme for the protection of labor, including the eight hour day, prohibition of labor to children under fifteen years of age, etc. See article **SOCIALISM** (paragraph England). The chief work of the Congress, however, was to take steps toward the founding of a labor federation which should unify the forces of labor in its contest with capital, and thus add to the power of the labor movement. The Congress declared in favor of the internationalism of the workingmen, and advocated the interchange of opinions with the workingmen of foreign countries and the holding of international Congresses in order to unite their interests. The British government was urged to support the Peace Conference proposed by the Czar, and militarism was declared to be the great enemy of labor. Some of the members were distinctly socialistic in their attitude. A prominent delegate from Bristol made a vehement socialistic speech in which he said it was the aim of the labor party not only to improve the economic conditions of its members, but to urge on the collectivist movement by every means in its power. Things were tending inevitably toward collectivism, as was shown by the organization of capital, the industrial revolution, the change in methods of production, the concentration of business, and the establishment of monopolies. The Trade Unions should do what they could to hasten the change. He wished to see them adopt a more aggressive policy, toward insuring the industrial and political emancipation of the proletariat. Strikes were not sufficient for the purpose; political pressure must be brought to bear. The unions should become a power in politics and have their own representatives in Parliament. Part of this programme was applauded, but, in general, the political activity of the unions was opposed. The Congress voted for the payment of members of Parliament, for universal suffrage, and for the modification of the law punishing the promoters of strikes. It also advocated the nationalization of mines and railways, though it rejected the scheme proposed by representatives from Edinburgh and Glasgow for the nationalization of the land and the means of production. Thus it did not go the whole length of socialism, but it went far enough to give some encouragement to the socialists of Germany. The organ of the Social Democrats, the *Vorwärts*, declared that Trade Unionism in England was tending slowly but surely toward socialism, in the conservative manner of the Anglo-Saxons. As usual the Congress chose its so-called Parliamentary Committee, an executive body which represents the unions and takes action in their behalf in the intervals between the meetings.

TRANCE. See **SPIRITUALISM**.

TRANS-MISSISSIPPI AND INTERNATIONAL EXHIBITION. See **OMAHA EXHIBITION**.

TRANSVAAL, whose official name is the South African Republic, lies between Portuguese East Africa on the east, British South Africa on the north and west and Orange Free State and Natal on the south, with an area of 119,139 square miles, and a population roughly estimated in 1896 at 245,397 whites and 622,500 natives. The

capital is Pretoria, with a white population of about 10,000, and the largest city is Johannesburg, with a population in the summer of 1896 of over 100,000, of whom half were whites and the remainder Kaffirs, Malays, Cooleys and Chinese. The Kaffirs being by far the most numerous of these. The economic growth of the Transvaal has been chiefly due to the rich gold mines which continue to be the main sources of wealth. The following table, taken from the *Statesman's Year Book*, shows the annual output of gold mines since 1891:

1891	£2,924,305
1892	4,541,071
1893	5,480,498
1894	7,667,152
1895	8,569,555
1896	8,603,821
1897	11,476,260

Among other minerals silver, copper, lead, iron and coal are found. Iron is said to be abundant, and there are many coal mines in operation. Agriculture, though as yet undeveloped, is one of the chief occupations and employs about one-third of the whole population; the agricultural production is not yet sufficient for domestic consumption. The chief products and exports are gold, wool, cattle, hides, grain, ostrich feathers, ivory, and minerals. Trade conditions during the year 1897 and 1898 were not satisfactory. For the year ending July 21, 1897, the value of goods entering the ports of Cape Colony for shipment to the Transvaal was \$21,206,002, as against \$28,895,273 for the year ending December 31, 1896, and the United States Consular Reports for December, 1898, show that the trade of the Transvaal in the summer of that year was still on the decline. By far the greater portion of the imports come from Europe, but imports to the value of more than one-half of these come from the neighboring colonies. The railway system has been well developed. In September, 1897, there were 716 miles of railway open for traffic, 270 under construction and 252 projected. There is telegraphic communication between the republic and the surrounding colonies and states. The state church is the United Dutch Reformed Church. This and the other Dutch churches are attended by the greater portion of the church-going population. Next in numerical importance are the members of the Anglican church, the Wesleyans, Jews, Presbyterians, Catholics, and the members of other Christian churches. The revenue is derived chiefly from the gold fields, the other sources including land sales, quit rents, customs, the hut tax, stamps and transport dues. The revenues have steadily increased since 1892, especially those derived from the gold fields. Toward the close of the year 1897 the public debt was about £2,700,000, of which £2,500,000 was the so-called Rothschild Loan, £146,690 the direct debt to the British crown, the latter bearing interest at 3½ per cent. There is a small force liable to military call in the event of war, but no standing army.

The Transvaal was founded by Boers, who emigrated from Cape Colony in 1835 to Natal, whence after the annexation of that colony by Great Britain they passed beyond the Vaal river, establishing there the state known as the Transvaal, whose independence was recognized by Great Britain in 1852. The Grondwet or fundamental law dates from February 13, 1858. Great Britain annexed the Transvaal in 1877, but the Boers revolted in 1880. According to the terms of the convention between Great Britain and Transvaal, signed in October, 1881, the latter was to manage its own local affairs, but to give the control of foreign affairs over to Great Britain as the suzerain power. By a later convention (February 27, 1884,) this control was expressly restricted to foreign affairs. Under the previous arrangement Great Britain had maintained a British Resident in the Transvaal, but since 1884 has been represented there by a diplomatic agent. The constitution, which has been repeatedly amended, vests the legislative authority in a Parliament of two houses, and the executive in a President, elected for five years, and a Council comprising the State Secretary, Commandant-General, Superintendent of Natives, and the Minute Keeper, with two non-official members. The population is divided into first and second-class burghers. The former are such male whites as resided in the republic before May 29, 1876, or took part in the war of 1881, the Malaboch War of 1894, the expedition to Swaziland of 1894, the suppression of the Jameson Raid of 1895-6, or wars with the natives. The children of first class burghers are reckoned in that class after they have reached the age of sixteen. Second class burghers include the naturalized male alien element of the population, with their children over the age of sixteen. Naturalization may be secured after a residence of two years upon payment of £2 and after twelve years of residence, burghers of the second class may be admitted to the first class by a special resolution of the upper chamber. The members of the Parliament or Volksraad, must be at least thirty years of age, and must be owners of fixed property, professors of the Protestant religion and in possession of their civil rights. In 1898 the President was

S. J. Paulus Krüger, who was elected for the fourth time in February of that year, and the Vice-President was P. J. Joubert.

The grievances of the Uitlander, or alien element, of the population have become familiar since the events of 1895-6. This element though very numerous and possessing, according to some authorities, more than half the land and at least nine-tenths of the property, have but little share in the government. The members of the first chamber of the Volksraad are chosen by the first class burghers from among their number, and from the qualifications for membership in this class, as stated above, it will be seen that its numbers are naturally very limited. In the election of members for the second chamber of the Volksraad, second class burghers may participate.

It will be remembered that this exclusion of the Uitlanders from what they regarded as their just political rights led to much discontent, which culminated in December, 1896. The National Union had been formed for the purpose of agitating for an extension of the franchise and of the right of representation and the adoption of other administrative reforms. The authorities were charged with corruption and extravagance. The members of the Union were determined to gain their ends by force, if necessary, and in 1896 they began to enlist members in great numbers, and organized a provisional government at Johannesburg, having heard that the Boers were about to attack the town. Then came Dr. Jameson's Raid, a blunder which ended in defeat and disaster. The malcontents at Johannesburg were disarmed and the members of the National Reform Committee were arrested and released only after the payment of heavy fines. For an account of the parliamentary investigation of the Jameson Raid and the responsibility of the British South Africa Company in connection therewith see the article **BRITISH SOUTH AFRICA COMPANY**.

The commercial depression continued during the year 1898. It was the necessary consequence of the political disturbances of 1896, and of the decline of mining shares in 1897, owing in part to the devastation of the rinderpest and the scarcity in the Northern part of the Transvaal. In the summer of 1897 an industrial commission was appointed to inquire into the causes of the depression in the mining industry. Its report, rendered on August 6, 1897, declared that the administration of the mines was in the hands of competent and practical men, who had introduced the most improved machinery. The commissioners did not think that the depression was caused by overstocking the market or by overtrading, but the cost of production had become extremely high and the labor question was growing serious. The government was asked to coöperate with the mine-owners in an endeavor to make the lower grade mines pay, and in general to lighten the burdens of the industry. If it did not, it was feared that fully one hundred mines would have to be closed, resulting in an enormous waste of capital. It was recommended that duties should be removed so far as possible from the necessities of life, that transit duties should be abolished, that the tariff of the Netherlands Railway should be reduced by 25 per cent. that every chance should be afforded for obtaining native labor, and that the monopoly of explosives should be cancelled if possible. It was said that the cost of labor, made up from 50 to 60 per cent. of the total cost of production, and that the wages of miners ranged from £18 to £30 a month in consequence of the high cost of living. The Commission proposed that labor contracts, signed in Europe, should be legalized in the Transvaal. While enforced labor was not recommended it was suggested that commissioners should be sent to the Kaffir chiefs to induce the latter to procure laborers for them. By these means, especially by the measures to lower the cost of living and lessen the expenses of production, it was hoped that the depression in the mining industry might be checked. And all commercial interests are so closely connected with this industry in the Transvaal that an improvement in the latter would be followed by a better condition in business generally.

In 1898 the constitutional question involved in the conflicting claims to authority on the part of the courts, and of the legislature was still unsettled. This question arose in 1897 from a decision of the High Court of Justice in the case of *Brown vs. The State*. The plaintiff was an American prospector, who had staked out claims in a tract of land which had been declared by proclamation to be open to the public. Upon application for licenses, however, he was notified that the proclamation had been withdrawn and afterwards the Volksraad confirmed this by a resolution. The case was decided for the plaintiff on the ground that a law could not be altered by mere resolution of the Volksraad nor could any law or resolution have binding force if it were contrary to the Grondwet. This decision was regarded by President Krüger and his cabinet officers as an encroachment on the authority of the Volksraad. The government claimed that the courts had no right to question a proclamation which had been confirmed by resolution of the Volksraad and a new law was passed, which declared that the Volksraad was the chief power in the state; that the courts had no right to test the validity of a law according to the Grondwet; that the Volksraad might alter the Grondwet and that Courts of Justice must enforce the enactments of the Volksraad. It was furthermore required that all judges, before taking offices, should swear "to act justly irrespective of persons, in accordance with the laws and

the Volksraad resolutions." And the President was empowered to remove any judge who would not take the oath. The judges declared this to be a gross encroachment on the independence of the judiciary, and urged the President to postpone action in the matter, but the latter insisted on prompt measures, and the bill was passed on February 25. The judges agreed not to question the constitutionality of Volksraad laws or resolutions for the present, but in the meanwhile it was understood that the government should bring about an amendment to the Grondwet forbidding any changes in that instrument except in a specially prescribed manner. But in spite of the demand for an immediate amendment the government was slow to act. The President had first requested the Volksraad to choose a committee which should coöperate with the government in preparing an amendment to the constitution and in codifying the laws. This meant a long delay and the judges protested that the promise of the executive had not been fulfilled. Accordingly it was agreed that the revision of the Grondwet should be undertaken before the codification of the laws.

In spite of the opposition to President Krüger on this and other grounds, it was a foregone conclusion that he would be reëlected president of the Transvaal. Out of 19,423 votes cast, President Krüger received 13,764, and on February 3 was elected to office for his fourth term of five years. Besides this constitutional question the campaign turned on the excessive powers possessed by the President, the undue limitation of the franchise, the dynamite monopoly, reforms in the mining industry, etc. It had been understood that the High Court of Justice was not to question the constitutionality of the laws, provided that after the election steps should be taken to amend the constitution in such a way as to guarantee the independence of the judiciary. But President Krüger soon after his election dismissed Chief Justice Kotze, who had been the most active opponent to the alleged encroachments of the legislative department on the powers of the courts, and put in his place a man who sympathized with the policy of the executive. Soon afterwards Judge Ameshoff, another of the judges who had decided for the plaintiff in the case of *Brown vs. The State*, on constitutional grounds, resigned his office, the new chief justice having been appointed to the vacancy to which Judge Ameshoff was entitled by seniority. Discussion over this question assumed a violent tone and Judge Kotze, the dismissed chief justice, threatened to appeal to England as the paramount authority. The retort of the President implied a disbelief in the British suzerainty.

This brought up the old question of the limits of British authority over the Transvaal. Some correspondence passed on this subject between the British Foreign office and the Transvaal. The term suzerainty had been struck out from the convention of 1884 on account of the objections raised against it by the Boers. While Mr. Chamberlain cared nothing about the terms in which the British authority was expressed, he insisted that that authority included an absolute control of all the foreign relations of the Transvaal. On May 27, 1898, a dispatch was published in the Transvaal declaring that the convention of 1884 did not grant the suzerainty of the Transvaal to the British government, but expressing the intention of the government of the Transvaal to abide fully by the terms of that convention.

The Transvaal side of the question was ably presented by an English writer in September, 1898. He points out that the Pretoria Convention of 1881 expressly grants to England suzerainty over the territory of the Transvaal. The Boers, however, fretted under this humiliation and succeeded at last in inducing the British government to consent to a new convention, namely the London Convention of 1884. This latter convention declared that the convention of 1881 contained provisions which "are inconvenient and impose burdens and obligations from all of which it was the object of the new convention of London to relieve the Transvaal." The new convention expressly recognizes the South African Republic as a new and separate state, to which it cedes the full right of control without interference in internal affairs. In foreign affairs it has, moreover, the right to send and receive ambassadors, and there is no denial of the right to make war and peace; but it is provided that if any treaty conflicts with the interests of Great Britain or any of Her Majesty's possessions in South Africa, it may be forbidden by the British government. Thus, all that can be claimed on the part of the latter is the right to veto a certain class of treaties. It can not, therefore, be said that a state in possession of its sovereign powers, in all save this one respect, is under the suzerainty of another state. Such are the arguments of those who would reduce the British control over the Transvaal to its lowest terms.

On the other hand the British government claimed to possess the right of control over all the foreign relations of the republic. The communications of the foreign office with the Transvaal on this point were not made public at the time, and the basis of the British claim was not officially stated; but among the arguments that have been employed on its behalf was the statement that the preamble of the convention of 1881 was still in force and that the intention of the framers of the later convention was to retain full control of all foreign relations, but to leave all other matters under the jurisdiction of the republic and to withdraw the word suzerainty out of regard to the susceptibilities of the Boers. In 1898 it was expected that a test case

would arise out of an extradition treaty with Portugal, which had been negotiated without the consent of the British government.

Toward the close of December there were alarming rumors of disturbances at Johannesburg, where it was said matters were approaching a condition like that which had just preceded the Jameson Raid. The feeling of racial animosity was intense, on account of certain measures provided by the government, which were regarded by the Uitlanders as an attack on their rights. A Boer policeman had shot and killed an Englishman whose house he had entered. The murderer was arrested, but the charge against him was reduced to manslaughter, and he was released on bail. Thereupon the British Agent demanded that the original charge of murder should be restored, and a mass meeting, attended by about 5,000 Uitlanders, was held to protest against the murder and to present a petition to the British Agent setting forth the grievances of the Uitlanders, and appealing for protection and for a cessation of the "intolerable state of affairs." No political speeches were made, owing to the law against political assemblies. The petition was afterwards presented to the Agent, the crowd signifying its approval by the raising of hands. The discussion in the press was exceedingly violent. The *Rand Post*, a Boer organ, was especially bitter, advising the removal of the women and children from Johannesburg, the razing of the city, and the punishment of the disorderly element by throwing them into the deep shafts of their own mines and burying them in the debris of their own machinery. Some of the more excitable of the Boers proposed the setting apart of January 2 as Jameson Day to be commemorated by the burning of Dr. Jameson in effigy. The government deprecated this inflammatory language, but it did not succeed in allaying the antagonism of the two factions. It was evident that the Uitlanders had been provoked beyond the point of endurance by the repressive measures of the government. The excitement in the Transvaal reached a higher pitch than it had reached at any time since the Raid.

TRESCOTT, WILLIAM HENRY, died at Pendleton, South Carolina, May 1, 1898. He was born at Charleston in 1822; was graduated at Charleston College in 1840, and three years later was admitted to the bar. About 1850 he published a book on American diplomacy, which attracted much attention. During the administration of President Pierce he was Secretary of Legation in London, and became Assistant Secretary of State in the Buchanan Cabinet, and at one time Acting Secretary. Upon the secession of South Carolina, he resigned and lived in retirement during and for a few years after the war. In 1875 he began the practice of law in Washington. The next year he was United States counsel before the fisheries commission at Halifax, and in 1880 was appointed by President Hayes one of the commissioners to negotiate a treaty with China. He was appointed minister to Chile, Bolivia, and Peru in 1881, and the next year, with General Grant, was a plenipotentiary to negotiate a treaty with Mexico. Mr. Tréscott wrote a number of books on diplomatic questions, and was regarded as a man of ability and tact.

TRINIDAD, an island constituting with Tobago a British possession lying off the Venezuelan coast north of the mouth of the Orinoco, has an area of 1,754 square miles and a population of about 248,400. The area of Tobago is 114 square miles, population about 20,500. There is a governor with an executive and a legislative council. The capital is Port of Spain (population 34,037). There are many private schools, a Roman Catholic college and the Queen's Royal College. In the 189 public schools there are reported 22,480 pupils. Its chief exports are sugar, cocoa, asphalt, and molasses. The value of the exports in 1897 was 1,994,926; imports, 2,161,231. The revenue in 1897 was 611,434; the expenditure 622,364. There are two banks, a volunteer corps of about 750, a police force of nearly 500; the total length of telegraph lines is 690 miles, of railway 54 miles with 30 miles additional under construction. The island contains a large "pitch lake" from which an American company took 96,385 tons of pitch in 1896. The governor in 1898 was Sir H. Gerningham.

TRIPOLI, a Turkish province in northern Africa on the Mediterranean sea with an area roughly estimated at 200,000 sq. m., but if Benghazi be included, of 398,900 sq. m. and a population of 800,000, 1,300,000 with Benghazi. Its government was placed directly under Constantinople in 1875 and it is administered as a separate province. The coast region is very fertile, producing all kinds of tropical fruits, grain, wine, cotton, madder, etc. Stock-raising is an important occupation. Commerce consists chiefly of the carrying trade to and from the Soudan. The foreign trade passes through the ports of Tripoli and Benghazi, while Murzuk is an important centre for inland traffic. In 1897 the imports amounted to about \$1,700,000, and the exports did not fall much below this figure.

TRUSS BRIDGES. See BRIDGES (paragraph Truss).

TRUSTS. The attitude of the United States government toward trusts is expressed by the Act of July 2, 1890, an Act "to protect trade and commerce against unlawful restraints and monopolies," which provides "that every contract or combination in the form of trust or otherwise, or conspiracy in restraint of trade or com-

merce among the several States or with foreign nations is hereby declared to be illegal." This statute was based upon the constitutional provision that Congress should have authority to regulate commerce with foreign nations and among the several States. Several important decisions of the Supreme Court defining the application of this statute were rendered in the year 1898. In the meanwhile, however, rules affecting its construction had already been laid down. For instance, in 1894 it was decided by the Supreme Court that the statute did not refer to transactions within the boundaries of single States. The case in which this was decided was that of the *United States vs. E. C. Knight Company*, and arose from the monopoly of the refined sugar manufacture. It was urged that the possession of this monopoly was a violation of the Act, since the sugar would be sold outside the States in which it was produced. The Court decided, however, that the destination of the sugar was a matter of no importance and that legally viewed the action of the corporation was wholly within the jurisdiction of the State in which it was located. Any different interpretation of the Act would give to Congress, in the opinion of the Court, control over practically all important business transactions which could be shown to affect indirectly interstate commerce. Any contracts or combinations to control domestic enterprise within the State may tend indirectly to restrain interstate commerce, but the national government did not by this Act intend to assume control over them to the exclusion of the jurisdiction of the State. The only things which this Act sought to prohibit were contracts, combinations or conspiracies which had to do with the final movement of the completed product from the State of its origin to the State of its destination. The Act did not apply to the processes of production, which were altogether distinct from interstate commerce.

The next important decision affecting the construction of the act was that in the case of the *Trans-Missouri Freight Association* in 1897. A large number of railroad companies had made an agreement to establish and maintain reasonable rates, rules, and regulations on all freight traffic of the associated roads. The emphasis was laid on the word reasonable, and it was urged on behalf of the companies that the kind of contracts, combinations and conspiracies referred to in the law, were only those which resulted in an unreasonable restraint of trade or commerce. As to this, the Court refused to consider the character of the restraining contract and held that the Act applied to all contracts whether reasonable or unreasonable that tended to the restraint of interstate or foreign trade. This was decided by a bare majority of the Court.

In another case, that of the *Joint Traffic Association*, there was an agreement among several railroad companies "to establish and maintain reasonable and just rates, fares, rules, and regulations on State and interstate traffic." The same principles were involved as in the case of the *Trans-Missouri Association* and the Court rendered an adverse decision on October 24, 1898. Some new arguments of importance were advanced at the trial. It was held that the Act as construed by the court in the case of the *Trans-Missouri Association* was unconstitutional on these grounds: The constitution gave Congress the power to regulate commerce, but this power was subject to another clause providing that no person should be deprived of liberty without due process of law. The rights which all persons possess of freedom in the making of contracts and in the choice and pursuit of callings could be limited by legislation only in so far as was compatible with the general welfare and security of society. A contract of any kind may be in effect a restraint of trade, but Congress has not the authority to prohibit such a contract merely on that ground. The reasonable or unreasonable nature of such restraint of trade, in other words its bearing upon the general welfare of society, must be determined before it is prohibited by law. The *Trans-Missouri* decision, however, had refused to take into account the reasonable or unreasonable character of such transactions. It seemed to assert the principle that Congress by an arbitrary act, could prohibit contracts which were in no wise detrimental to the general welfare. Now that this principle was admitted there was nothing to prevent the prohibition of a great variety of business contracts of perfectly justifiable nature. As illustrations of the sort of contracts which might be prohibited as in restraint of trade, were mentioned organizations of mechanics to limit the number of persons employed in the industry and to maintain wages; a contract of partnership or the incorporation of a company consisting of persons previously engaged in the same line of business; the sale of the good will of a business with an agreement not to enter the field as a competitor, etc.

The Court admitted that the constitutional rules as thus interpreted were correct. Such contracts as were cited, however, did not come within the legal definition of contracts, combinations or conspiracies in restraint of trade. The Court said that "the Act of Congress must have a reasonable construction or else there would scarcely be an agreement or contract among business men that could not be said to have indirectly or remotely some bearing upon interstate commerce or possibly to restrain it." The principle of the decision rendered in the *Trans-Missouri* case was that only such contracts or combinations as were directly in restraint of trade fell within the pro-

vision of the law. The law did not apply to those contracts whose effects were indirectly in restraint of trade. This decision was again rendered by a bare majority.

Another important case decided at the same time was that of the Kansas City Live-Stock Exchange, which was said to be an illegal combination in restraint of commerce, because by the rules of the Exchange the members were in some degree restricted in their dealings with outsiders, and because these rules in other ways limited trade to some extent. Here the Court decided that the Anti-Trust Act did not apply to any other trade or commerce than that which exists or may exist among the several States or with foreign nations; it was not to be construed as applying to all operations which might in the long run add to the cost of such foreign or interstate commercial interchange. Although the members of the Kansas City Live-Stock Exchange dealt in live-stock which was purchased from or sold in other States and Territories, it did not fall within the terms of the statute as being in restraint of trade. In this decision the Court was unanimous.

It is obvious that some limitation of the bearing of the Act in practice was necessary, since otherwise it would have had a range far beyond that which was intended. It was a difficult thing to impose these limitations without real or apparent inconsistency. Such inconsistency becomes conspicuous in a comparison of the Joint Traffic case or the Live-Stock Exchange case with the Trans-Missouri case. In the latter case the demand that the Act should be construed reasonably and not literally was rejected and the Court declared that any contract in restraint of interstate or foreign trade whether reasonable or not, was prohibited. In each of the two former cases, however, the Court said that a reasonable construction must be given to the Act and that certain contracts did not come within a legal definition of acts in restraint of trade, and that the Act did not apply to contracts which only indirectly tended to restrain interstate trade. To sum up, the construction placed by the Court upon this Act down to the close of the year 1898 has established the following principles. 1. The statute does not relate to any transactions that take place only within the boundaries of a single State. 2. It does not relate to transactions which have only an indirect effect in restraint of interstate commerce. 3. In determining whether contracts or combinations exert a direct restraint upon interstate commerce, the Act is to be reasonably interpreted. 4. That any transactions which do so directly tend to restrain trade fall whether reasonable or not, under the prohibitions of the Act. Thus prices may be kept up by a combination or producers in any one State even though the commodity is destined for exportation to another State; wage-earners may form combinations to limit the number employed in any particular industry or to maintain wages; persons may combine to maintain the price of goods or services or facilities which are employed in interstate commerce; and in general any line of action whether in the long run restrictive of interstate commerce or not is not within the application of the Act unless its effect is directly in restraint of that commerce. Thus, after eight years of application the Act has been found in practice to have a very limited scope. So far as there is a further demand for legislation in restraint of combinations and monopolies, it can be met only by the legislative branches of the different State governments, if the Act of July 2, 1890, continues to be interpreted as at present.

TUBERCULOSIS. The question of the contamination of milk as a source of tuberculosis in children has been thoroughly re-discussed during the past year. Sheridan Delepine, of London, Eng., examined 208 samples of milk with the result of finding tubercle bacilli in a small proportion of the samples from cows in advanced stages of tuberculosis. His most interesting report is that of 93 samples of milk collected at railway stations in Liverpool and Manchester, 22 contained tuberculosis bacilli. The same milk injected hypodermically produced septicæmia in 9 per cent. of the cases examined, while in from 16 per cent. to 24 per cent. considerable irritation of the tissues resulted. He considered the noxious properties to be principally due to contamination at the time of or after milking. He recommends boiling the milk, analysis of samples from time to time, systematic inspection of cow-sheds and milch cows by veterinary surgeons, and application of the tuberculin test, and testing all imported cattle. Tucker Wise, of New York, claims that canaries and other pets are frequent subjects of tuberculosis. It is stated that date figures show that in New York City since the adoption of the compulsory notification of tuberculosis to the Health Department the death rate from all varieties of tuberculosis has diminished 12.8 per cent., and that from pulmonary tuberculosis alone has diminished 11.3 per cent. The edict of the Health Department in that city against spitting on the floors of public conveyances is not enforced, and so far it is fruitless.

"The Association for the Prevention of Consumption and Other Forms of Tuberculosis" was founded in London, Eng., during the past summer, and more recently a similar association was organized in Durham. The objects of these associations are to maintain a central bureau for the collection and distribution of information as to modes of diffusion of tuberculosis and measures of prevention; the circulation of pamphlets setting forth in plain language the results of scientific investigation of the

foregoing points; public lectures; the promotion of self-supporting sanitarium for tuberculous patients and the procurement of proper legislation.

Excellent work during the year has been done by the Pennsylvania Society for the Prevention of Tuberculosis. During 1898 it has distributed 5,000 copies of a pamphlet entitled "How Store-keepers and Manufacturers Can Help to Prevent the Spread of Tuberculosis," as well as 20,000 re-prints of former publications. Special effort was made to establish a Municipal Hospital for Tuberculous Patients and a Sanitarium in some elevated portion of the State. A location for the latter has been offered on conditions. The State Board of Charities has recommended an appropriation of \$30,000 on condition that the Society raise a like amount, for the construction of the Sanitarium. A proper site has been selected. The report states that but 10 per cent. of the deaths in the city of Philadelphia are now due to tuberculosis, as against 14 per cent. fifteen years ago, and considers this improvement due to enlightenment concerning the disease and its prevention. Controlling expectoration in public places is attempted. The State Live-Stock Sanitary Board of Pennsylvania, during the 2½ years of its existence has, as a result of its inspections caused the condemnation and destruction of more than 3,500 tuberculous cattle. The proportion of diseased cattle in infected herds has, during the same time fallen from 30 per cent. to 10 per cent.

Stubbert, of the Loomis Sanitarium at Liberty, N. Y., where only cases of pulmonary tuberculosis are taken, reports on 200 cases treated there during the past year. Ichthyol and hot air inhalations were used with considerable success. In 34 cases treated with anti-tubercle serum there was marked improvement in the physical signs, expectoration cough, appetite and weight, while in more than one-half the temperature improved and in many the bacillus decreased or disappeared. See PUBLIC HEALTH and SANITARY LEGISLATION.

TUNIS is a French dependency on the Mediterranean coast of Africa between Algeria and Tripoli with an area of about 50,000 square miles and a population estimated at 1,700,000, of which the French in 1896 numbered 26,678, and of these about 10,000 were soldiers. The Bedouin Arabs and Kabyles form the chief elements in the population. The capital is Tunis with a population of 153,000, including 40,000 Europeans. Agriculture is the chief occupation and the principal products are wheat, barley, olive oil, wine, and live-stock. In accordance with the usual colonial policy of France there is a tax on imports and France possesses the largest share of the trade. The exports include wheat, olive oil, cattle, barley, wines, tanning bark, sponges, alfa and diss. There are about 900 miles of railway, most of which belongs to the state, and there are over 2,000 miles of telegraph line. Tunis is a French protectorate. The rights of France were acknowledged in 1882. The native Bey is allowed to retain his throne, but the French Minister Resident practically manages affairs under the control of the French foreign office. See ARCHÆOLOGY (paragraph France).

TURKEY, or the OTTOMAN EMPIRE, includes extensive lands in Europe, Asia and Africa and comprises Turkey proper, under the direct government of the Sultan, and several dependent and tributary states. The statistics of area and population are based upon estimates. According to the latest estimates available in 1898 the area was 1,576,700 sq. m. and the population about 38,791,100. Exclusive of the states nominally subject to Turkey the area is about 1,147,578 sq. m. and the population about 23,187,659.

Industries, Manufactures and Trade.—Although the soil is naturally fertile but a small proportion of the arable land is under cultivation. The methods employed in agriculture are very primitive. The chief products are tobacco, cereals, cotton, figs, nuts, almonds, grapes, olives, fruits, coffee, madder, opium and gums. Owing to the lack of enterprise among the natives and to the insecurity for investment of foreign capital, the industries have not made much progress. The culture of silk worms is important and some of the silk is used in the native manufactures but most of it is exported. The country is rich in minerals including coal, copper, silver, iron, lead, manganese, chrome, bitumen, sulphur, salt and alum. There is said to be a large supply of coal but it has not been developed. The mineral industries suffer from governmental restrictions. There is a 20 per cent. export duty upon minerals. There are few manufactories, but Constantinople contains a number of factories for boots and shoes, cotton cloth, hats and caps, which are owned by the government, and among the manufactures carried on by private persons are artificial ice, glass, beer, paper, cotton yarn and tobacco. The chief exports are grapes, silk, cotton, mohair, barley, cocoons, opium, valonia and coffee. The chief trade of Turkey is with Great Britain, Austria, France, Russia, Italy, Bulgaria, Persia, Roumania, Greece, Egypt, the Netherlands and Germany. In 1893-94 the exports amounted to 1,326,241,567 piastres, and the imports to 2,410,866,078 piastres, the piastre being worth 4.4 cents in United States gold. The trade of Turkey with the United States during the fiscal year ending June 30, 1898, was, exports from Turkey to the United States, \$4,444.415; imports from the United States to Turkey, \$382,205. In 1898 there was no direct steamship

connection between Turkey and the United States and Turkish goods destined for the latter country had to be transferred at the ports of Liverpool, Marseilles, Hamburg, Havre and Genoa. It was said in one of the Consular Reports for that year that the whole question of extending American trade with Turkey depended upon the establishment of a direct line of steamships between New York or Philadelphia and the Mediterranean and Black sea ports, for competition with English and German goods would be difficult so long as the United States merchants had to bear the extra charges incident to transshipment. The total railway mileage open for traffic in the summer of 1897 was 2,542.

Finances.—The chief source of revenue is the direct taxes, but the customs duties and the taxes on salt, tobacco, spirits, stamps, fisheries, silk, etc., are also important. The estimate for the year ending February 28, 1898, places the revenues at 1,851,132,200 piastres and the expenditures at 1,842,941,100 piastres. The administration of the debt has been entrusted to a Council of Administration at Constantinople, which collects the taxes on salt, spirits, stamps, fisheries, and silk, the duties on tobacco, the tribute from Cyprus, and Eastern Roumelia, the Tumbeki and the tobacco Régie profits. In 1898 the consolidated public debt was £92,007,616.

The Army.—Considerable time elapsed after the cessation of the Græco-Turkish hostilities in 1897 before the world was brought to a full realization of the strength of the Turkish army. However slowly occidental ideas are penetrating the Ottoman Empire, it is admitted that the army is thoroughly organized on modern, western principles; and this is not entirely new, but was begun by Mahmud II more than seventy years ago. Though Christians and non-Moslems are not exempt from war taxes, the army is composed only of Mohammedans. Young Moslems, having attained the age of twenty-one, are expected to enter the service for twenty years, unless they can give good reasons for not doing so,—such as physical incapacity or unusual family obligations. About 120,000 men are liable to be drawn into the service each year, but as a matter of fact only about 65,000 actually enter the army. The regular army in time of peace numbers 244,000, of whom 24,000 are officers, but the war footing is fully 800,000. It will be remembered that in the spring of 1897 the Sultan speedily mobilized 600,000 men, and he is reported to have said that in the near future he will have a war footing of 1,500,000. It should be understood, however, that at least one-third of these will be untrained.

The troops are drawn from all parts of the Empire, which is divided into seven military districts, each district furnishing a corps; these districts are known as Constantinople, Salonika, Adrianople, Damascus, Erzinjan, Bagdad and Sana. General Nelson A. Miles, U. S. A., who inspected the Turkish army in May, 1897, considers the soldiers very effective. He attributes this to the long war record Turkey has had during this century, to the long period of service required of each soldier, and especially to the Mohammedan religion, which teaches loyalty to despotism, temperance and simplicity of life, and insures the pleasures of an everlasting and sensuous heaven to the "faithful." The ordinary war expenses are low, those for the year 1897-98, exclusive of the additional expenses incurred by the Greek War, being about \$25,250,000. The pay of the common soldier is a little less than a dollar a month, and often the government is several months in arrears. The administration of the army is exceedingly complicated, there being a large number of committees and bureaus, each with its separate functions to perform.

The two most prominent officers in the Turkish army are Osman Pasha and Edhem Pasha. The former, a man of great intelligence and ability, gained much valuable experience, and has a record for great bravery, in the Crimean and Russo-Turkish Wars, and is said to be the military genius of the army. He is about sixty-seven years old. Edhem Pasha, a somewhat younger man, though not nearly so well known as the older general, has a reputation for ability and courage; he conducted the successful campaign against the Greeks in 1897. The Sultan, Abdul Hamid II, is not only the nominal, but the real head of the army.

Power of the Sultan.—Abdul Hamid II is said to be one of the most autocratic rulers that ever sat on a throne in Europe or Asia, and he makes use of his enormous power, not only in state affairs, but in the war department. Though modern methods obtain under Abdul Hamid in the organization of the army, the despotic Sultan has given to the other departments of the government a distinctly oriental character. His predecessors were accustomed to acquiesce in the decisions of the Sublime Porte, but he has totally divested his Ministers of all ruling power, the Grand Vizier and Ministers being puppets in his hands. His coadjutors, whom unfortunately he has taken in large measure from the lower and more ignorant class of society, have no right of opinion. The Sultan is shrewd, but jealous and suspicious, the spy system being used very extensively by him. His absolutism is the greatest hindrance to reform. The concessions he has made to representatives of western powers have almost always been shams and have proved of no real benefit. The Turkish army may be taken as an indication of Ottoman progress and ability to absorb western ideas, but

as long as the Ministers and the Sublime Porte remain ineffective there is little hope of an amelioration of social conditions in the Empire.

The Navy.—At the beginning of 1898 the Turkish navy comprised 12 coast defence ships; 6 cruisers of the second and third classes; 6 gunboats, etc.; 26 torpedo craft, of which 19 were of the first class. The crews are recruited partly by conscription and partly by voluntary enlistment. The largest vessels in 1898 were the *Mesoudieh*, with a displacement of 8,900 tons, and the *Abdul Kader*, with a displacement of 8,000 tons. The sailors in the Turkish navy number about 30,000 and the marines 9,000.

Religion.—The prevailing religion is Mohammedanism. According to the latest figures available in 1898, the Ottoman Empire contained about 16,000,000 Mohammedans and 5,000,000 Christians. These estimates rest mainly upon conjecture for the census begun in 1885 gives only the figures for certain parts of the Empire. According to these figures, Asia Minor contained 7,179,000 Mussulmans, 576,200 Armenians, 972,300 other Christians, and 184,600 Jews, etc.

Government.—Turkey is an absolute monarchy, the will of the Sultan being subject only to the accepted truths of the Mohammedan religion. His authority is both legislative and executive and he appoints the two chief dignitaries in the Empire, viz: the Grand Vizier, who represents him as the head of the temporal government, and the Sheik-ul-Islam, who represents him as the head of the church. There is a cabinet of ministers, known as the Medjliss-i-Hass, consisting of 13 members, including the Grand Vizier and the Sheik-ul-Islam, and the Empire is administratively divided into 31 vilayets or governments, which in turn are subdivided into sanjaks or provinces, districts, subdistricts and communities.

The nominally dependent States are Bulgaria, Bosnia and Herzegovina, Egypt and Samos. To Crete, which was formerly a Turkish dependency, autonomy was granted in 1896 and in 1898 the Turks evacuated the island. The Sultan is Abdul Hamid II, who came to the throne in 1876. In 1898 the Grand Vizier was Halil Rifaat Pasha.

HISTORY.

Results of the War With Greece.—The treaty of peace between Greece and Turkey was signed on December 4, 1897. Its principal terms, which are stated in the article Greece (q. v.), include the rectification of the Græco-Turkish frontier, the payment of a war indemnity of \$17,600,000 to Turkey and the evacuation of Thessaly by the Turkish troops within a month after the powers shall have recognized the fulfillment of the conditions by Greece. Greece agreed to place the control over certain of her revenues in charge of an international commission in order to guarantee the payment of the war indemnity. On May 6 Great Britain, France and Russia having made arrangements with Greece for using a loan to meet the war indemnity, notified the Porte that the evacuation of Thessaly should begin. On June 6 the last of the Turkish troops left Thessaly, which was then transferred to the Greeks. The delay had been caused by the difficulty of arranging the matter of the loan.

The Balkan States.—In the summer of 1898 serious trouble arose between the Christians and the Mohammedan Albanians in the Berane district, near the Montenegrin frontier, and resulted in the destruction of many villages (see MONTENEGRO). At the same time there were threatening signs in this as well as in the four other Balkan States, where there was a tendency to draw together and establish a new kingdom or federation of kingdoms to be known as the Greater Servia (see the article SERVIA). There was evidence too that Russian influence was gaining the ascendancy in the Balkan States.

Armenia.—While occasional outrages and murders took place in 1898, there appears to have been no concerted massacre of the Armenians. Early in the year disorders were reported to have occurred near Van and in other places, and it was said that the Kurds were laying waste some of the native villages. The long delay of the Porte in the matter of indemnifying the United States for the damage inflicted upon American property by mobs during the massacres caused much indignation in the latter country, especially when after many months had passed the Porte took the position that it was not responsible for the damages because they were inflicted during the insurrection of its Armenian subjects. A number of strong measures were advocated, and it was even suggested that the United States break off its diplomatic relations with Turkey or blockade a Turkish port or seize one of her ports and appropriate its revenues to the amount of the indemnity. None of these measures were adopted. The other powers were also unsuccessful in their attempts to secure indemnities for losses sustained by their subjects. The sum of 1,600,000 francs was claimed by the French and Italian governments for damages inflicted upon their subjects at the time of the massacres in Constantinople and they tried to impound the last installment of the war indemnity due from Greece to Turkey. The British government also claimed £33,000 as an indemnity for British subjects. The Porte repudiated its responsibility for all these damages.

The Cretan Question.—An account of affairs in Crete during the year and of the

action of the European concert on the subject of Cretan self-government is given in the article Crete (q. v.). The Turkish troops remained in the island during the greater part of the year. The feud between the Mohammedan and Christian inhabitants resulted in many outrages, and but for the rule of the Admirals the chaotic condition of affairs would have ended in anarchy and civil war. On October 5 the great powers, Great Britain, France, Russia and Italy, notified the Porte that the Turkish troops must be withdrawn within a month, and refused to accept his partial acceptance of that demand in agreeing to withdraw the troops from all parts of the island except three fortified places. In the meanwhile had occurred the killing of the British troops at Candia and the only solution of the problem appeared to be Turkish evacuation. On October 15 the Sultan agreed unconditionally to withdraw the troops. The Russian nomination of Prince George of Greece as the Governor of Crete was accepted, and at the close of the year 1898 the political outlook on the island was promising. For an account of the German Emperor's visit to Turkey, see the article GERMAN EMPIRE.

TYNG, STEPHEN HIGGINSON, JR., D. D., died in Paris November 17, 1898. He was born in Philadelphia in 1839; was graduated at Williams College, 1858; studied at the Virginia Episcopal Seminary; was ordained in 1861, and entered the ministry in New York City, his first work being as assistant to his father in St. George's. In 1865 he organized, and became rector of, the Church of the Holy Trinity; he resigned this position in 1881. During his pastorate he was interested extensively in charitable work, and wrote much on subjects of sociology and political economy. Upon retiring from the ministry, in 1881 he went to Paris as an insurance agent; soon after a lawsuit revealed that during his ministry he had speculated heavily in Wall street. From 1881 his attention was given chiefly to insurance and other business interests in Paris and London. He edited the *Working Church* and the *Christian at Work*, 1864-70. Among his publications are *The Square of Life, He Will Come*, and several volumes of sermons entitled *The People's Pulpit*.

TYPHOID FEVER. The consensus of opinion of clinicians seems to be in favor of the value of the Widal test for typhoid fever. By means of its use suspected cases not positively diagnosed from clinical evidences have had the advantage of earlier treatment, the Widal reaction having proved conclusive in the earlier stage of the disease. The test is made thus: Two constrictions about a half-inch apart are made by heating and drawing out in a flame a small glass tube, about one-eighth of an inch in diameter. The tube is then broken at one of the constrictions. The skin of a patient with suspected typhoid fever having been cleansed and dried, a small prick is made and a drop of blood obtained, which is sucked up into the small bulb of the glass tube. After coagulation of the blood has resulted, a drop of blood-stained serum is blown out of the tube upon a clean cover-glass. On this glass are also placed nine drops of a bouillon culture containing actively motile typhoid bacilli, not more than 24 hours old, and a mixture is made of the fluids, forming a diluted serum of the strength 1:10. The preparation is examined at once by the microscope. If the serum used is that of a patient suffering with typhoid fever the typhoid bacilli cease actively darting about and adhere one to another, forming clumps. In most instances this reaction takes place in a few minutes; in some it is not well marked for a half-hour or longer. A great many independent observers agree that this is a specific reaction, occurring only in typhoid fever.

The epidemic of 1898 emphasized the fact that the following are the principal sources of infection: leak of sewage containing dejecta of typhoid fever patients into buildings, infected milk supply, pollution of soil or of street dust, and infected water supply.

The late Ernest Hart, of London, reported upon the origin of epidemics of typhoid fever, sketching the histories of 205 epidemics, all of which had their origin in the water supplies which were polluted from the deposit of excreta in streams, by drainage from manure fields, or various other sources.

The Brand method of sponging the patient with ice water when the temperature reaches 102° F. still proves to be the most efficient treatment, its mortality being about 9 per cent. as against 14 per cent. by the old methods. See PUBLIC HEALTH, WATER PURIFICATION and WATER WORKS.

UGANDA, a British protectorate in eastern Africa, has an advantageous situation lying along the northern shores of the Victoria Nyanza and including the head waters of the Nile. Its boundaries were extended in 1896 and include, besides Uganda proper, the Unyoro, Usoga, and other countries. It has a rich soil and the natives have shown some skill in manufactures. Trade with the outside world is expected to develop rapidly upon the completion of the railway from Mombasa in the East Africa Protectorate to Lake Victoria Nyanza. Rapid progress was made on this railway in 1898. The capital is Mengo, and another important place is Port Victoria, which has been chosen as the terminus of the railway. The government is administered by a

British Commissioner (E. J. Berkeley, in 1898), but the native prince retains a nominal authority in Uganda proper.

The kingdom of Uganda was the subject of rivalry between France and England. The latter, represented by Col. F. D. Lugard, finally prevailed. Col. Lugard entered the country in 1891 as the representative of the Imperial British East Africa Company and his mission was to spread the English sphere of influence northwest from Mombasa on the Eastern coast to the valley of the Nile. The country was the prey of religious and political strife. The pagans were hostile to the forms of religion, brought in by outsiders, but the Arab Mohammedans, the French Roman Catholic missionaries, and the Protestant representatives of the English Church Missionary Society made many converts. Soon there were two parties composed of the Christian and pagans on the one side, and the Mohammedans, on the other, the purposes of these parties, however, being political rather than religious. The allied Christians and pagans, under Col. Lugard, were at length victorious over a large force of the Mohammedans. Col. Lugard now tried to restore order, but there was dissension between the Christians themselves, who were divided into a French and an English party and the pagans and Mohammedans did not lose their former antagonism. Writing of the future of the country, in 1898, Col. Lugard expresses high hopes of the development which will follow the completion of the railway. He says: "The railway proceeds but slowly; and when it reaches the vast lake a new era will dawn, not only for Uganda, but for Central Africa. The development of the country will be on no known lines; for when in the world's history have countries in the heart of a till recently unexplored land and peopled by savages, absolutely devoid of clothes, begun their march of progress by a ready-made railway 700 miles long? This vast stretch of land reaching from the sea to the inland lakes is for the most part a very beautiful country, and a very fertile one. Its products may be almost anything that will grow in a subtropical region and a rich soil. They will be what the world of commerce needs and will be dictated by the wants of civilized men. Indigenous coffee, fibers of value, rubber, oil, seeds and other products may be quoted; but where a railway runs from one of the finest harbors in the world to the second largest lake on the planet it has almost seemed to be idle to forecast the future commercial possibilities of a country where the soil is rich, the rainfall abundant, and the altitude renders the climate very fairly healthy, even in spite of the known dangers of virgin soil and virgin forests."

UNDERGROUND TROLLEY. See CONDUIT ELECTRIC RAILWAYS.

UNION VETERAN LEGION, organized in Pittsburg, Pa., in 1884, has now a membership exceeding 20,000. These consist of officers, sailors, soldiers, and marines of the United States army, navy, or marine corps, who volunteered prior to July 1, 1863, and July 22, 1861, for three years' service, and served their time, unless prevented by wounds. The 152 encampments now exist in 21 States and the District of Columbia. National Commander, Winfield S. Norcross, Lewiston, Me.

UNION VETERANS' UNION, organized in Washington, D. C., in 1886, now consists of 65,000 members, soldiers, sailors and marines who served in the Union army in 1861-5. Its objects are "to unite in bearing each other's burdens; to care for the widow and orphans; to keep alive the memory of our participation in the events and perils of the war, and to preserve and perpetuate the principles for which we fought; to recognize the rights of the Union soldier to positions of public trust, and his preferment over all others for employment under the government, he being fitted and qualified for the position he applies for." Commander-in-Chief, Charles W. Wood, Worcester, Mass.

UNITARIANS. The chief work of this sect in 1898 was the establishment of a church in Lincoln, Neb., and one in Amherst, Mass. Their mission work lay chiefly in the United States, but they also maintained a mission in Japan, and correspondence with their churches in Hungary. The report of 1898 shows 454 churches, 551 ministers, and 75,000 members. The American Unitarian Association, organized in Boston in 1825 will hold its annual meeting in Boston in May. Officers: President, Carroll D. Wright, Washington, D. C.; Secretary, Samuel A. Eliot, Cambridge, Mass.

UNITED AMERICAN MECHANICS, JUNIOR ORDER OF, a fraternal society founded in 1853, has 38 State councils, 2,271 sub-councils, and 179,994 members; \$3,586,623 has been disbursed since 1853, and \$558,049 during its last fiscal year. National Councilor, F. W. Pierson, Wilmington, Del.; National Secretary, E. S. Deemer, Philadelphia.

UNITED AMERICAN MECHANICS, ORDER OF, a fraternal society founded in 1845, has 20 State councils, 753 sub-councils, and 52,964 members. During its last fiscal year it has disbursed \$148,287. National Councilor, J. T. Boyer, Winfield, W. Va.; National Secretary, John Servee, Philadelphia.

UNITED BRETHREN IN CHRIST, a religious body formed in 1760 among the Germans of Pennsylvania through the efforts of Philip William Otterbein (1726-1813), a missionary of the Dutch Reformed Church, and Martin Boehm. At the twentieth general conference held in York, Pa., in May, 1889, when 45 conferences and 5 mission districts were represented the revised constitution and confession was ratified by a general vote and went into effect on May 13 of that year. Immediately Bishop Wright and eleven delegates organized a church, or conference on the original tenets of faith. The belief of the United Brethren of the new constitution seems to be a mixture of Presbyterianism, Methodism, and Congregationalism; that of the followers of the old constitution is Arminian. The denomination suffered a great loss in 1898 by the massacre of seven missionaries at Rotofunk on the west coast of Africa; and a loss of property in Sierra Leone and other places on account of an uprising of natives. The church sent missionaries to Japan in 1898. In 1898 the United Brethren (New Constitution) had 3,206 churches, 1,724 ministers and 242,602 members. The total contributions amounted in 1898 to \$1,307,547; and there are 3,571 Sunday schools, with 292,464 scholars. The latest report of the commissioner of education shows the United Brethren to have in the United States 8 institutions of higher education with 54 officers of instruction, 350 students, and endowments amounting to \$105,948. Their publishing house, in Dayton, Ohio, reported great prosperity. The United Brethren (Old Constitution), have 1,150 churches, 700 ministers, and 43,338 members.

UNITED CONFEDERATE VETERANS, was organized in New Orleans, La., in 1889. The members will "endeavor to unite in a general federation, all associations of Confederate veterans, soldiers and sailors now in existence or hereafter to be formed; to gather authentic data for an impartial history of the war between the States; to preserve relics or mementoes of the same; to cherish the ties of friendship that should exist among men who have shared common dangers, common sufferings, and privations; to care for the disabled and extend a helping hand to the needy; to protect the widows and the orphans, and to make and preserve a record of the resources of every member, and, as far as possible, of those of our comrades who have preceded us in eternity."

The headquarters are in New Orleans, the number of camps is 1,170, the membership about 45,000. The State organizations are called divisions. All the State commanders have the rank of Major-General. The organ, *The Confederate Veteran*, is published in Nashville, Tenn. Commander, General John B. Gorgon. The last reunion was held in July, 1898, in Atlanta, Ga.; the next will be in Charleston, S. C., in May, 1899.

UNITED DAUGHTERS OF THE CONFEDERACY, organized in Nashville, Tenn., in 1894, is composed of widows, wives, mothers, sisters, daughters and lineal female descendants of those who served in the Confederate Army and Navy, or who rendered personal service to the Confederate cause. There are 400 chapters scattered through the United States, with about 8,000 members. President, Mrs. Kate Cabell Currie, Dallas, Texas.; Secretaries, Mrs. John P. Hickman, Nashville, Tenn., and Mrs. Annie W. Duncan, Vicksburg, Miss.

UNITED EVANGELICAL CHURCH had during 1898 the most encouraging year in its history. The statistics report 10,667 additions to the church, which now consists of 59,190 members, 640 itinerant and local preachers, and 684 churches. The Evangelical Association consists of 1,053 ministers, 1,787 churches, and 116,714 members.

UNITED FRIENDS, ORDER OF, founded in 1881, consists of 6 grand councils; 239 sub-councils, and 10,491 members. Since its organization \$5,360,262 in benefits have been disbursed and \$347,400 during the last fiscal year. Imperial Councillor, J. G. H. Meyers, New York; Recorder, R. H. Burnham, New York.

UNITED METHODIST CHURCH. See METHODIST CHURCH, FREE.

UNITED PRESBYTERIAN CHURCH OF NORTH AMERICA had a successful year and reports 939 ministers, 961 churches, and 126,339 members, of whom 12,052 are in the foreign field. There were 1,107 Sunday schools, 1,017 Young People's Societies, and \$1,457,939 were raised. Much work was done in the Freedmen's missions, and the foreign missions in the Punjab, India, and in Egypt were encouraging. The General Assembly divided the work in the latter country into four presbyteries: the Delta, Middle Egypt, Assiut, and Thebes; and the Synod of the Nile was organized. The Young People's Christian Union was enlarged by the incorporation of the Associate Reform Church, while the societies increased by 68 and the members by 1,840.

UNITED SOCIETY OF CHRISTIAN ENDEAVOR, established at Portland, Me., in 1881, for training young converts for the duties of church membership. Its motto is "For Christ and the Church." It is interdenominational and has been adopted by every Protestant sect. The society is strongest in the United States. The next international convention will be held at Detroit, July 5-10, 1899.

In 1898 there were in all 54,611 societies, young people's, juniors', intermediate, mothers', seniors', and parents' societies, with a total membership of 3,276,660. In the United Kingdom of Great Britain there are 5,575 centres. In addition there are 12 "floating" societies on ships. President of the society, Rev. F. E. Clark; General Secretary, J. W. Baer.

UNITED SOCIETY OF FREE BAPTIST YOUNG PEOPLE, composed of young people of the Free Baptist denomination. President, E. P. Metcalf, Providence; Secretaries, May Malvern, Portland, Me., and Henry S. Myers, Hildale, Mich.

UNITED SONS OF CONFEDERATE VETERANS, organized in Charleston, S. C., in 1896, consists of 6,000 members. Commander-in-Chief, Robert A. Smyth, Charleston. This society has local camps throughout the country. Its last reunion was held in Richmond, Va.

UNITED STATES. The area of the United States, including Alaska, is 3,557,000 square miles, and its population was estimated on December 31, 1898, at 75,330,000. The area of the islands acquired as a result of the war with Spain is 168,287 square miles, with an estimated population of 10,177,000.

Agriculture, Live-Stock, etc.—The grain production of the United States in the calendar year 1898 was: corn, 1,924,184,660 bushels; wheat, 675,148,705; oats, 730,906,643; barley, 55,792,257; rye, 25,657,522; and buckwheat, 11,721,927. The total value of these crops was \$1,171,410,283. Potatoes yielded 102,306,338 bushels, value \$79,574,772; and hay, 66,376,920 tons, value \$398,060,647. In the crop year 1897-8 the production of cotton was, upland, 10,821,578 bales; sea island, 76,279—total bales, 10,897,857; total value, \$319,491,412. There has been no official reporting on the tobacco crop since 1896. The returns of the number of live-stock on farms and ranches on Jan. 1, 1899, show: horses, 13,665,307; mules, 2,134,213; milch cows, 15,090,115; oxen and other cattle, 27,994,225; sheep, 39,114,453; and swine, 38,651,631. There was an increase in cows and sheep and a decrease in all other animals in a year; but the average farm value of every description of live-stock was higher than on Jan. 1, 1898, when the total reached \$1,891,577,471.

Public Domain.—The following tabular statement shows an approximate estimate of the quantity of vacant public lands, together with the area reserved and appropriated, in the several land districts at the close of the fiscal year ending June 30, 1898. As little if any public land remains in Ohio, Indiana, and Illinois, and as Alaska is almost wholly unsurveyed and unappropriated, those areas are excluded in the aggregate.

STATE OR TERRITORY.	AREA UNAPPROPRIATED AND UNRESERVED.			Area reserved.	Area appropriated.	Total area land surface.
	Surveyed.	Unsurveyed.	Total.			
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Alabama.....	622,373	.....	622,373	68,240	32,048,397	32,738,910
Arizona.....	11,380,680	42,438,308	54,809,028	11,734,022	4,626,465	77,181,915
Arkansas.....	3,606,900	.....	3,606,900	1,820	29,844,500	33,453,220
California.....	84,272,434	8,280,589	92,553,023	16,198,170	40,688,800	149,439,993
Colorado.....	26,273,705	4,484,846	30,758,551	6,222,538	20,466,566	57,447,645
Florida.....	1,562,968	164,382	1,727,350	19,940	33,467,365	35,304,655
Idaho.....	11,208,786	82,908,168	94,116,954	1,469,400	6,622,262	100,196,616
Indian Territory.....	.....	.....	.....	19,575,040	.....	19,575,040
Iowa.....	.....	.....	.....	.....	25,122,400	25,122,400
Kansas.....	1,000,000	.....	1,000,000	967,875	50,234,342	51,234,342
Louisiana.....	890,137	65,018	955,155	1,474,894	29,632,408	30,662,460
Michigan.....	905,945	.....	905,945	87,746	29,227,339	30,134,030
Minnesota.....	3,240,498	2,473,828	5,714,326	4,968,400	40,985,705	51,668,451
Mississippi.....	563,050	.....	563,050	.....	29,781,050	30,344,100
Missouri.....	443,911	.....	443,911	.....	43,369,080	43,812,991
Montana.....	10,982,437	54,674,779	65,657,216	11,424,213	12,257,901	87,349,329
Nebraska.....	10,548,450	.....	10,548,450	70,032	28,515,367	39,133,839
Nevada.....	29,170,480	22,179,199	51,349,679	5,094,409	2,894,182	59,344,260
New Mexico.....	42,080,738	12,917,042	54,997,780	8,129,448	11,289,722	74,217,000
North Dakota.....	11,717,278	8,857,095	20,574,373	3,650,710	21,277,764	41,852,147
Oklahoma.....	7,000,000	2,400	7,002,400	2,216,180	1,130,361	10,218,841
Oregon.....	24,005,723	11,412,106	35,417,829	5,467,702	20,290,047	61,175,578
South Dakota.....	10,800,000	2,000,000	12,800,000	10,000,000	24,000,000	36,800,000
Utah.....	9,800,000	34,127,000	43,927,000	5,254,487	3,254,487	52,435,974
Washington.....	6,319,288	8,122,154	14,441,442	11,131,345	24,110,157	38,552,889
Wisconsin.....	418,709	.....	418,709	.....	24,465,948	24,884,657
Wyoming.....	22,040,654	6,130,509	28,171,163	8,171,043	5,190,494	41,432,700
Grand total.....	316,716,806	262,651,971	579,368,777	129,516,276	637,899,428	1,346,784,471

For further information see the article LANDS, PUBLIC.

Commerce.—In Secretary Gage's report submitted to Congress on December 6, it is shown that during the fiscal year ending June 30, 1898, the grand total of exports surpassed that of any previous year. The value of agricultural products exported from the United States was \$853,683,570, which exceeded by \$54,355,338 the largest amount ever before reached, namely that of 1892. The exportation of wheat and flour surpassed that of any previous year except 1892, and the exportation of cotton, corn and oats, as well as of meat and dairy products surpassed that of any previous year. The exports of manufacture also reached the remarkable figure of \$290,697,354, and in this advance nearly all forms of manufacturing industry had a share. Especial gainers, however, were manufactures of iron and steel, leather, boots, shoes and mineral ores. It is further said that the prices obtained were higher than in the year ending June 30, 1897. As to the imports they had a lesser valuation than in any previous year except 1880, being only \$616,049,654 as against \$764,730,412 in the year ending June 30, 1897. Compared with the year ending June 30, 1897, the total exports to Europe from the United States increased \$160,420,601 and the imports decreased \$124,258,514. Oceanica was the only great division of the globe with which the trade of the United States showed a falling off. With Asia the trade was very active, being nearly double that of the preceding year in the matter of exports. For a comparison of the commerce of the United States with that of other countries see article IMPORTS AND EXPORTS.

At the close of the year Secretary Gage estimated, after deducting something for freight, something for insurance, and the amount spent abroad by tourists, the net excess of exports at about \$300,000,000 for the calendar year. This so-called favorable balance of trade was a source of satisfaction to many, who measured by it the financial prosperity of the country. Still, the continuance of such a prodigious excess in the future would hardly be possible, or even desirable. The table on page 794 gives the imports and exports for the fiscal years 1897 and 1898, showing the amounts of the former which are dutiable, and free of duty, and classifying the latter as agricultural, manufacturing, mining, etc.

The relative value of American trade with foreign countries is shown by the following table of exports and imports for the year ending June 30, 1898:

Countries.	Twelve Months Ending June.	
	Imports. 1898.	Exports. 1898.
EUROPE.		
Austria-Hungary	\$4,716,510	\$5,697,912
Azores, and Madeira Islands.....	23,797	377,715
Belgium	8,741,826	47,606,311
Denmark	211,837	12,697,421
France	52,730,003	95,452,692
Germany	69,696,907	155,039,972
Gibraltar	32,519	304,829
Greece	910,390	127,559
Greenland, Iceland, etc.....	144,227	225
Italy	20,300,291	23,270,858
Malta, Gozo, etc.....	13,476	64,352
Netherlands.....	12,535,110	64,274,622
Portugal	2,605,323	3,532,057
Roumania	12	111,154
Russia, Baltic, etc.....	2,649,966	6,333,317
Russia, Black Sea.....	1,889,723	1,002,705
Servia	12,095	.....
Spain	3,575,385	10,228,545
Sweden and Norway.....	2,673,880	6,313,786
Switzerland	11,380,835	263,970
Turkey in Europe.....	2,119,337	139,075
United Kingdom	109,138,365	540,860,152
Total Europe	\$306,091,814	\$973,609,289
NORTH AMERICA.		
Bermuda	466,780	998,911
British Honduras	156,875	555,179
British North America:		
Nova Scotia, New Brunswick, etc.....	4,262,641	4,537,513
Quebec, Ontario, etc.....	22,774,918	74,965,989

Imports and Exports of Merchandise.

GROUPS.	JUNE—				TWELVE MONTHS ENDING JUNE—			
	1927		1928		1927		1928	
	Dollars.	Per cent.	Dollars.	Per cent.	Dollars.	Per cent.	Dollars.	Per cent.
FREE OF DUTY:								
Imports.								
Articles of food, and live animals.	12,281,568	82.25	12,167,801	82.06	124,012,048	82.45	126,051,027	82.06
Articles in a crude condition for domestic industry.	20,516,646	49.56	12,166,288	37.04	194,564,246	50.95	185,241,519	50.26
Articles manufactured—								
For mechanical arts.	2,128,800	7.54	1,891,400	6.94	29,684,451	7.55	17,281,491	6.97
For consumption.	2,091,779	8.20	590,061	2.55	24,700,275	6.49	9,241,512	3.17
Articles of voluntary use, luxuries, etc.	1,060,811	2.47	94,023	.41	8,746,359	2.25	4,467,399	1.53
Total free of duty.	41,159,291	100	28,919,591	100	381,938,243	100	391,382,949	100
DUTYABLE:								
Articles of food, and live animals.	15,025,191	24.12	8,418,126	29.79	121,183,211	30.45	78,518,924	20.07
Articles in a crude condition for domestic industry.	1,589,608	4.16	4,418,009	15.61	50,382,685	5.51	49,342,885	15.16
Articles manufactured—								
For mechanical arts.	5,144,073	14.01	4,177,288	14.75	57,939,091	14.97	52,278,432	14.20
For consumption.	12,530,210	30.93	6,090,477	21.41	109,694,951	28.64	73,328,175	22.55
Articles of voluntary use, luxuries, etc.	7,286,682	18.72	5,287,768	18.44	74,382,661	20.40	72,982,162	22.46
Total dutiable.	44,025,720	100	28,300,315	100	382,792,169	100	324,622,211	100
FREE AND DUTYABLE:								
Articles of food, and live animals.	27,310,757	38.25	16,912,369	38.02	245,198,179	38.05	161,490,011	39.46
Articles in a crude condition for domestic industry.	22,166,446	26.99	16,974,885	32.36	214,916,695	29.10	204,543,917	39.20
Articles manufactured—								
For mechanical arts.	9,291,263	10.91	5,798,793	11.26	97,173,512	11.40	69,937,938	11.26
For consumption.	17,081,969	19.96	6,640,569	12.67	124,275,186	17.54	82,570,897	13.40
Articles of voluntary use, luxuries, etc.	8,402,464	9.87	5,881,791	10.39	83,068,970	10.86	77,452,561	13.55
Total imports of merchandise.	85,183,081	100	61,219,925	100	794,739,412	100	616,005,159	100
Per cent of free.	48.67		44.73		49.95		47.30	
DUTIES COLLECTED.	21,591,122		14,555,729		176,312,298		169,312,294	
Remaining in warehouses at the end of the month.	18,135,728		27,727,454					
DOMESTIC EXPORTS.								
Products of—								
Agriculture.	28,396,895	54.26	29,616,354	68.39	653,471,129	66.23	654,627,089	70.41
Manufactures.	26,870,507	25.99	27,215,899	29.20	277,285,301	20.37	298,971,449	28.37
Mining.	1,864,678	2.54	1,973,147	2.12	50,804,573	2.01	19,432,417	1.03
Forest.	4,790,316	6.65	3,660,643	4.14	40,489,321	8.22	27,000,171	8.12
Fisheries.	228,855	.28	835,070	.86	5,477,951	.55	5,534,925	.48
Miscellaneous.	143,222	.20	130,994	.12	3,479,228	.34	3,551,203	.29
Total.	71,867,408	100	80,012,468	100	1,082,007,653	100	1,210,592,007	100
Foreign:								
Free of duty.	628,738	53.16	855,812	45.88	8,745,495	14.36	9,389,999	44.62
Dutiable.	611,708	46.84	991,080	54.48	9,289,459	45.64	11,719,905	55.37
Total.	1,240,446	100	1,846,892	100	18,034,954	100	21,109,904	100

Countries.	Twelve Months Ending June.	
	Imports. 1898.	Exports. 1898.
British North America:		
British Columbia.....	\$4,604,853	\$4,202,483
Newfoundland and Labrador.....	375,355	1,205,275
Total British North America.....	\$32,017,767	\$84,911,260
Central American States:		
Costa Rica	2,597,661	1,578,343
Guatemala	1,837,459	1,205,280
Honduras	844,533	702,171
Nicaragua	1,095,513	1,086,680
Salvador	891,314	747,684
Total Central American States.....	\$7,266,480	\$5,320,158
Mexico	19,000,137	21,205,234
Miquelon, Langley, etc.....	161,030	205,005
West Indies:		
British	10,664,410	8,382,740
Danish	327,759	707,622
Dutch	174,243	544,463
French	30,888	1,617,248
Haiti	1,127,675	2,968,579
Santo Domingo	2,131,046	1,151,258
Spanish—Cuba	15,232,477	9,561,656
Porto Rico.....	2,414,356	1,505,946
Total West Indies.....	\$32,102,854	\$26,439,512
• Total North America.....	\$91,171,923	\$139,635,289
SOUTH AMERICA.		
Argentina	5,915,875	6,429,070
Bolivia.....	.....	19,675
Brazil	61,750,369	13,317,056
Chile	3,736,622	2,351,727●
Colombia	5,185,295	3,277,507
Ecuador.....	765,590	855,193
Falkland Islands .....	.....	1,010
Guianas:		
British	3,058,896	1,792,912
Dutch	1,455,749	381,322
French	16,009	132,596
Paraguay .....	.....	699
Peru	725,362	1,302,695
Uruguay	1,772,310	1,214,248
Venezuela	7,711,449	2,746,261
Total South America.....	\$92,093,526	\$33,821,971
ASIA.		
Aden.....	2,017,756	593,345
China.....	20,326,388	9,992,894
East Indies:		
British	27,238,459	4,695,855
Dutch	14,529,335	1,201,574
French .....	.....	152,147
Portuguese ...	.....	.....
Hong-kong	746,517	6,265,200
Japan	25,224,102	20,502,136
Korea .....	.....	125,936

Countries.	Twelve Months Ending June.	
	Imports. 1898.	Exports. 1898.
Russia, Asiatic	111,050	618,015
Turkey in Asia.....	2,325,078	243,190
All other Asia.....	76,352	433,976
Total Asia	\$92,595,037	\$44,824,268
OCEANICA.		
Auckland, Fiji, etc.....	.....	4,743
British Australasia	5,578,898	15,603,763
French Oceanica.....	181,121	300,446
German Oceanica .....	.....	8,959
Hawaiian Islands	17,187,370	5,906,361
Spanish Oceanica	8,811	4,503
Tonga, Samoa, etc.....	68,605	34,802
Philippine Islands	3,830,415	127,804
Total Oceanica	\$26,859,220	\$21,991,381
AFRICA.		
British Africa	875,338	12,027,142
Canary Islands.....	26,283	274,827
French Africa.....	476,836	668,186
German Africa .....	.....	2,319
Liberia	6,670	12,683
Madagascar	15,365	226,738
Portuguese Africa.....	15,343	2,898,058
Spanish Africa.....	33	29,074
Turkey in Africa:		
Egypt	5,033,295	686,005
Tripoli	59,470	130,910
All other Africa	685,006	401,210
Total Africa	\$7,193,639	\$17,357,752
Grand total	\$616,005,159	\$1,231,329,950

Industries.—See COTTON AND THE COTTON INDUSTRY, IRON AND STEEL, MANUFACTURES, MINING, SUGAR, RAILWAYS, STRIKES AND LOCKOUTS, etc.

Internal Communications.—The two principal authorities on railroad matters differ somewhat in the annual summaries. The Inter-State Commerce Commission, reporting for the year ending June 30, 1897, gave the total steam surface mileage on that date as 184,428.47, an increase in a year of 1,651.84; while *Poor's Manual of Railroads* for 1898, reporting for the year ending Dec. 31, 1897, gave the total mileage as 184,603.19, an increase in a year of 2,188.43. These totals relate to main lines. The first authority reported the aggregate length of all tracks as 243,441.41 miles. Taking *Poor's Manual* because of its later date, it appears that the capital stock of all steam surface railroads was \$5,453,782,046; bonded debt, \$5,411,058,525; unfunded debt, \$374,389,673; current accounts, \$392,481,496—total liabilities, \$11,631,711,740. The assets comprised cost of railroads and equipments, \$10,029,151,607; real estate, stocks, bonds and other investments, \$1,509,841,062; other assets, \$222,089,700; current accounts, \$170,531,284—total assets, \$11,931,613,663; excess of assets over liabilities, \$299,901,913. Traffic earnings were, from passengers, \$253,557,936; freight, \$780,351,939; miscellaneous, \$89,636,791—total, \$1,123,546,666; net earnings, \$338,170,195; receipts from other sources, \$95,013,907—total available revenue, \$433,184,102; total payments, \$406,036,348—surplus for the year, \$27,147,754. During the year ending June 30, 1897, the number of railroad casualties was 43,168; killed or fatally injured, 6,437; otherwise injured, 36,731. The casualties to railroad employees were 1,693 killed and 27,667 injured; to passengers, 222 killed and 2,795 injured. One passenger was killed for every 2,204,708 carried, and one injured for every 175,115 carried.

In 1898 the principal canals used for commercial purposes numbered 38; had a total length of 2,525 miles; and had cost for construction and improvements \$185,218,526. During the season of 1897 the Erie, Champlain, Oswego, Black river, and Cayuga and Seneca canals, all in New York, transported a total of 3,617,804 tons of

freight, 2,448,361 going eastward and 1,169,443 westward. The St. Mary's Falls canal, connecting Lakes Superior and Huron, in the same season, transported 18,982,755 tons of freight, and from April to October, 1898, a total of 18,509,048 tons. The registered tonnage of vessels that passed through this canal was 17,619,933 in 1897 and 16,426,472 in the seven months of 1898. The gross tonnage of all vessels that passed through the famous Suez canal in 1897 was 11,123,403, showing the larger commercial value of the St. Mary's Falls waterway.

At the close of 1898 the Western Union Telegraph Company was operating 189,847 miles of land lines and cables and 874,420 miles of wire; had 22,210 offices; handled 62,173,749 messages; and had \$6,090,151 profits. The American Bell Telephone Company had in 1897, capital, \$23,650,000; total miles of wire, 536,845; circuits, 264,645; rented instruments, 772,627; and stations, 325,244.

Immigration.—An account of some of the characteristics of the immigration to the United States during the year 1898 will be found in the article Immigration (q. v.). The following table gives the number of immigrants to the United States, by sex and nationality, for the fiscal years ending June 30, 1897, and June 30, 1898, respectively:

NATIONALITIES.	TWELVE MONTHS ENDING JUNE 30.					
	1897.			1898.		
	Males.	Females.	Total.	Males.	Females.	Total.
Austria-Hungary:						
Bohemia and Moravia.....	947	1,007	1,954	1,181	1,287	2,468
Galicia and Bukowina.	3,152	2,615	5,767	6,865	5,552	12,417
Other Austria.....	5,976	4,809	10,785	5,468	2,765	8,233
Hungary.....	8,698	6,827	15,525	9,561	7,101	16,662
Belgium.....	490	270	760	424	270	694
Denmark.....	1,212	873	2,085	1,204	742	1,946
France (including Corsica).....	1,209	898	2,107	1,232	757	1,989
Germany.....	11,899	10,634	22,533	9,073	7,999	17,072
Greece.....	548	25	571	2,265	98	2,363
Italy.....	41,448	17,985	59,431	40,241	18,365	58,606
Netherlands.....	558	332	890	507	267	774
Norway.....	3,535	2,807	5,342	3,005	1,981	4,986
Portugal.....	962	912	1,874	856	860	1,716
Roumania.....	413	378	791	522	381	903
Russia (proper).....	12,436	10,814	22,750	15,716	11,478	27,194
Finland.....	1,458	1,608	3,066	1,874	1,233	2,607
Poland.....	2,654	1,511	4,165	2,998	1,728	4,726
Spain.....	407	41	448	511	68	577
Sweden.....	6,231	6,981	13,162	5,442	6,956	12,398
Switzerland.....	975	591	1,566	824	422	1,246
Turkey in Europe.....	110	42	152	139	87	176
England.....	5,998	3,976	9,974	5,943	3,984	9,877
Ireland.....	11,549	16,872	28,421	9,959	15,176	25,125
Scotland.....	1,054	829	1,883	1,100	697	1,797
Wales.....	589	331	920	758	461	1,219
Not specified.....	18	7	25	1	.....	1
Total Europe.....	124,472	91,925	216,397	127,162	90,558	217,720
Mexico.....	42	49	91	39	68	107
Central American States:						
Costa Rica.....	1	.....	1	.....	.....	.....
Nicaragua.....	1	.....	1	1	.....	1
Honduras.....	.....	.....	.....	1	.....	1
Guatemala.....	.....	.....	.....	1	.....	1
Salvador.....	1	.....	1	.....	.....	.....
Central America, not specified.....	2	.....	2	2	.....	2
Total Central American States..	6	.....	6	5	.....	5
British Honduras.....	1	.....	1	.....	2	2
British North America:						
Quebec and Ontario.....	151	97	248	158	88	196
Nova Scotia.....	5	3	8	12	2	14
New Brunswick.....	1	.....	1	10	1	11
Prince Edward Island.....	.....	.....	.....	12	.....	12
British Columbia.....	12	3	15	91	14	105
Newfoundland and Labrador.....	11	7	18	11	1	12
Total British North America....	180	110	290	294	56	350

NATIONALITIES.	TWELVE MONTHS ENDING JUNE 30.					
	1897.			1898.		
	Males.	Females.	Total.	Males.	Females.	Total.
Cuba	1,968	1,585	3,553	997	880	1,877
Other West Indies.....	293	255	548	145	102	247
South America	28	21	49	30	9	39
Turkey in Asia (Arabia and Syria)....	3,203	1,529	4,732	2,651	1,624	4,275
China	3,334	29	3,363	2,061	10	2,071
Japan.....	1,420	106	1,526	2,115	115	2,230
Asia, not specified.....	40	1	41	51	4	55
Australia.....	65	74	139	115	44	159
Hawaiian Islands.....	29	26	55	26	14	40
Pacific Islands, not specified.....	3	2	5	6	2	8
Africa.....	24	13	37	88	10	98
Grand total	135,107	95,725	230,832	135,735	93,493	229,228

Navigation.—In the report of the Secretary of the Treasury, Lyman J. Gage, submitted to Congress on December 6, 1898, several proposals were made with a view to developing the merchant marine of the United States and promoting the domestic ship-building interests. The substance of these proposals is worth noting here, since they occasioned considerable comment and aroused some opposition in the public press. The Secretary calls attention to the fact that the expulsion of Spain from the Philippines and her West Indian possessions will probably lead in course of time to a withdrawal of Spanish support from the mail steamship lines which have connected its former possessions with the rest of the world. It seems probable that if the United States made no effort to develop navigation between that country and the islands of the Pacific and Asia the carrying trade formerly possessed by Spain would fall to the lot of some more enterprising nation, such as Great Britain, France, or Germany. A positive and aggressive policy was recommended, having for its aim the establishment anew of an American sea-going maritime fleet. In order to place the American merchant on a firm footing in the face of severe competition on the part of nations already far advanced in respect to their carrying trade, it was necessary in the opinion of the Secretary for the government to render financial aid. He found that it was the practice of the governments of other maritime nations to contribute in some way or other to the development of their merchant shipping. He pointed to the fact that Great Britain, Germany and France have contributed liberally from the public funds for the establishment of steamship lines, regarding such lines as an element of political strength and commercial advancement; that France, Italy, and Japan have applied public money to the promotion of their merchant marine on the ground that such a measure was to the advantage of national defense; that Great Britain seemed to recognize the same principle by applying about a million dollars each year to the training of merchant seamen as naval reserves and by refunding light dues to British vessels which furnished such reserves. He also emphasized the fact that Great Britain and Germany imposed reasonable taxes upon the shipping entering their ports and that other maritime nations follow that policy in some degree, whereas the United States, although three-fourths of the international shipping entering its ports is foreign, has levied comparatively slight charges, or none at all. Another point of difference between the policy pursued by foreign maritime nations and our own is the permission accorded by foreign governments to their ship-owners to purchase vessels built in other countries, whereas it has been the policy of the United States to discourage American ownership of foreign vessels. Building upon these facts as precedent, Secretary Gage proposed the five following changes:

First.—A remodeling and extension of the act of March 3, 1891, relating to the carrying of ocean mails in American steamships, so that it shall meet requirements which have arisen since the law went into operation.

Second.—The establishment of a system of graded bounties upon the mileage navigated by registered American vessels while engaged in the foreign carrying trade as compensation for the training of seamen available for the National defense, the system to have regard also to the construction of vessels which may be promptly and economically converted into cruisers, troop-ships, colliers, and supply ships for the use of the government. Special provision should also be made for vessels and men engaged in the deep-sea fisheries.

Third.—Extended application of the principle of the act of May 10, 1892, by virtue of which the *St. Louis* and *St. Paul* were constructed in this country, upon the registry



COLONEL GEORGE E. WARING.

of the foreign-built ships *New York* and *Paris*, this extension to continue for a short term of years, and to be so guarded as to preserve the coasting trade to American-built vessels.

Fourth.—A moderate increase in the rates of our tonnage taxes, equalizing them with the corresponding charges at present imposed at London, Liverpool, and Hamburg.

Fifth.—The restriction of the trade between the United States, Porto Rico, and Hawaii, and the coasting trade of those islands to vessels of American registry.

The following table gives statistics in regard to the merchant vessels of the United States for the fiscal years 1897 and 1898:

	1897.		1898.	
GEOGRAPHICAL DISTRIBUTION.				
Atlantic and Gulf coasts	<i>Number.</i> 16,592	<i>Gross tons.</i> 2,647,796	<i>Number.</i> 16,442	<i>Gross tons.</i> 2,553,739
Pacific coast.....	1,581	439,012	1,754	496,767
Northern lakes.....	8,280	1,410,103	8,256	1,437,500
Western rivers.....	1,280	272,109	1,253	261,732
Total.....	22,633	4,769,020	22,705	4,749,738
POWER AND MATERIAL.				
Sail:*				
Wood	15,940	2,276,988	15,896	2,237,153
Iron and steel.....	94	133,524	97	140,662
Total.....	16,034	2,410,462	15,993	2,377,815
Steam:				
Wood	5,670	1,284,859	5,775	1,288,785
Iron and steel.. ..	929	1,073,699	937	1,063,138
Total.....	6,599	2,358,558	6,712	2,351,923
Canal boats.....	650	73,786	660	74,640
Barges.....	1,480	432,523	1,667	467,348
Total.....	2,130	506,309	2,327	541,988
TRADE.				
Registered:				
Steam, iron and steel.....	108	222,136	119	245,059
Steam, wood.....	144	36,837	193	49,005
Sail,† wood and iron, and steel.....	968	547,111	824	443,645
Total.....	1,220	806,084	1,136	737,709
Enrolled and licensed:				
Steam, iron and steel.....	826	851,562	915	978,741
Steam, wood.....	5,526	1,248,521	5,485	1,099,118
Sail,* wood and iron, and steel.....	15,051	1,863,353	15,169	1,934,170
Total.....	21,403	3,963,436	21,569	4,012,029
CONSTRUCTION DURING THE YEAR.				
<i>Geographical Distribution.</i>				
Atlantic and Gulf coasts	609	96,009	514	68,090
Pacific coast.....	64	7,495	228	49,789
Northern lakes.....	120	116,937	87	54,084
Western rivers.....	98	11,792	123	13,495
Total.....	891	232,233	952	180,458
<i>Power and Material.</i>				
Sail:				
Wood.....	327	29,678	357	27,602
Steel.....	11	34,681	2	6,724
Steam:				
Wood.....	244	27,917	343	57,337
Iron and steel.....	44	78,236	51	43,501
Canal boats.....	70	10,216	20	2,386
Barges:				
Wood.....	182	40,027	169	30,777
Steel.....	13	11,528	10	7,041
Total.....	891	232,233	952	180,458

*Including canal boats and barges.

†Including barges.

During the fiscal year 1898 the receipts from tonnage taxes amounted to \$846,771, as against \$731,770 for the previous year.

For an account of the relations of the government to the Indians, and of patents, pensions, and the tariff, see the titles INDIANS OF THE UNITED STATES, PATENTS, PENSIONS, and TARIFF OF THE UNITED STATES.

Religion.—The only compilation of religious statistics since the census of 1890 is that made annually by the *Independent*. Its summary for the calendar year 1898 is as follows:

Denominations.	Members.	Gain.
Adventists, six bodies.....	84,454	2,509
Armenians, two bodies.....	5,924	5,589
Baptists, thirteen bodies.....	4,364,427	131,465
Brethren (River), three bodies.....	4,739	.....
Brethren (Plymouth), four bodies.....	6,722	.....
Catholics, four bodies.....	8,395,178	219,791
Catholics, Apostolic.....	1,491	.....
Christadelphians	1,277	.....
Christians, two bodies.....	124,368	2,868
Christian Catholics	14,000	9,000
Christ, Missionary Association.....	754	.....
Christian Scientists	70,000	30,000
Christian Union	18,214	.....
Church of God (Winnebrenarian).....	38,000	.....
Church Triumphant	384	.....
Church of the New Jerusalem.....	6,702	*972
Communitic Societies, six.....	3,930	.....
Congregationalists	625,864	10,669
Disciples of Christ.....	1,085,615	34,536
Dunkards, four bodies.....	109,194	8,000
Evangelical, two bodies.....	175,904	24,134
Friends, four bodies.....	118,626	1,152
Friends of the Temple.....	340	.....
German Evangelical Protestant.....	36,500	.....
German Evangelical, Synod.....	199,234	4,616
Greek Church, two bodies.....	48,030	34,326
Jews	1,200,000	.....
Latter-Day Saints, two bodies.....	340,639	43,269
Lutherans, twenty bodies.....	1,526,552	36,678
Mennonites, twelve bodies.....	56,318	1,774
Methodist, seventeen bodies.....	5,898,094	162,196
Moravians	14,553	333
Presbyterians, twelve bodies.....	1,542,401	52,239
Protestant Episcopal, two.....	689,347	21,844
Reformed, three bodies.....	370,277	13,056
Salvationists	40,000	.....
Schwenkfeldians	303	.....
Social Brethren	913	.....
Society Ethical Culture.....	1,300	236
Spiritualists	45,030	.....
Theosophists	3,000	.....
United Brethren, two.....	285,940	5,823
Unitarians	75,000	5,000
Universalists	48,856	2,169
Volunteers of America.....	2,000	.....
Independent Congregations.....	14,126	.....
Total	27,714,523	862,300

A comparison of this total with that of the census of 1890 shows a gain in church membership in nine and a half years of 7,101,717.

Army.—The important facts in regard to army administration during the year 1898 are given in succeeding paragraphs and in the article SPANISH-AMERICAN WAR (q. v.). By his proclamations of April 23, and May 25, the President called for an additional force of 200,000 volunteers. Congress also authorized the increase of the regular force to 61,000 men. The Secretary of War states that including the volunteers and the recruits for the regulars, the total force consisted of 274,717 men. On August 18, the order for the mustering out of a hundred thousand volunteers

*Decrease.

was issued. In view of the greater demand upon the military of the United States the Secretary of War recommended that the regular army should be increased to a hundred thousand men. As to the expenditures of the War Department, and the criticism of its methods, some account will be found in the paragraphs on War Revenue, Cost of the War, War Administration, and Criticism of the War Department.

The Navy.—The following table taken from the report of the Secretary of the Navy for the year 1898 shows the fighting force of the navy on August 15, the enlisted force having reached at that date the maximum allowed by law, namely, 24,123 men:

Battle-ships (first-class)	4
Battle-ship (second-class)	1
Armored cruisers	2
Coast-defense monitors	6
Armored ram.....	1
Protected cruisers.....	12
Unprotected cruisers.....	3
Gunboats	18
Dynamite cruiser.....	1
Torpedo boats	11
Vessels of old Navy, including monitors.....	14
Auxiliary navy:	
Auxiliary cruisers	11
Converted yachts	28
Revenue cutters	15
Light-house tenders	4
Converted tugs	27
Converted colliers	19
Miscellaneous	19

At the date of the report, November 15, 1898, the vessels in process of construction, with the contract speed and probable date of completion, were as follows:

No.	NAME OF VESSEL.	WHERE BUILDING.	Contract speed.	Probable date of completion.
	<i>Battleships.</i>		Knots.	
5	Kearsarge	Newport News	16	August, 1899.
6	Kentucky	"	16	"
7	Illinois*	"	16	April, 1900.
8	Alabama*	Cramp & Sons	16	September 24, 1899.
9	Wisconsin*	Union Iron Works	16	September 1, 1899.
10	Maine†	Cramp & Sons	18	June 1, 1901.
11	Missouri†	Newport News	18	June 11, 1901.
12	Ohio†	Union Iron Works	18	June 5, 1901.
	<i>Sheathed Cruiser.</i>			
	Albany.....	Armstrong's, England.....	20	.....
	<i>Monitors.</i>			
7	Arkansas†	Newport News	12	January 11, 1901.
8	Connecticut†	Bath Iron Works	12	January 19, 1901.
9	Florida†	Lewis Nixon.....	12	October 11, 1900.
10	Wyoming†	Union Iron Works	12	January 5, 1901.
	<i>Torpedo-boat destroyers.</i>			
1	Bainbridge†	Neale & Levy	28	April 1, 1900.
2	Barry†	"	28	"
3	Chauncey†	"	28	"
4	Dale.....	Wm. R. Trigg Co	28	.....
5	Decatur	"	28	.....
6	Hopkins†	Harland & Hollingsworth.....	29	April 19, 1900.
7	Hull	"	29	"
8	Lawrence†	Fore River Engine Co	30	January 29, 1900.
9	MacDonough†	"	30	February 28, 1900.
10	Paul Jones†	Union Iron Works	29	April 5, 1900.
11	Perry†	"	29	"
12	Preble†	"	29	"
13	Stewart†	Gas Engine and Power Co	29	February 28, 1900.
14	Truxtun†	Maryland Steel Co.....	30	April 4, 1900.
15	Whipple†	"	30	"
16	Worden†	"	30	"

* The probable date of final completion of the *Illinois*, *Alabama* and *Wisconsin* is based on the supposition that armor will be provided in due season.

† The date of "probable completion" given is that named in the contract.

No.	NAME OF VESSEL.	WHERE BUILDING.	Contract speed.	Probable date of completion.
<i>Torpedo boats.</i>				
9	Rowan.....	Moran Bros.....	30	Completed, except official trial
9	Dahlgren.....	Bath Iron Works.....	30	February 1, 1899.
10	T. A. M. Craven.....	.....	30	March 1, 1899.
11	Farragut.....	Union Iron Works.....	30	Completed, except official trial
12	Davis.....	Wolff & Zwicker.....	22.5	do.
13	Fox.....	.....	22.5	December 1, 1898.
17	Mackenzie.....	Chas. Hillman Co.....	30	Completed, except official trial
19	Stringham.....	Harlan & Hollingsworth.....	30	January 29, 1899.
20	Goldsbrough.....	Wolff & Zwicker.....	30	In doubt.
21	Bailey.....	Gas Engine and Power Co.....	30	February 1, 1899.
24	Bagley.....	Bath Iron Works.....	30	October 19, 1899.
25	Barnett.....	" " ".....	28	" " "
26	Biddle.....	" " ".....	28	" " "
27	Blakely.....	Geo. Lawley & Sons.....	24	September 27, 1899.
28	DeLong.....	.....	28	" " "
29	Nicholson.....	Lewis Nixon.....	28	September 26, 1899.
30	O'Brien.....	.....	28	" " "
31	Shubrick.....	Wm. R. Trigg Co.....	28	" " "
32	Stockton.....	" " ".....	28	" " "
33	Thornton.....	" " ".....	28	" " "
34	Tingey.....	Columbian Iron Works.....	28	October 1, 1899.
35	Wilkeat.....	Gas Engine and Power Co.....	28.5	September 30, 1899.
<i>Training vessel for Naval Academy.</i>				
	Chesapeake.....	Bath Iron Works.....	Sailing vessel.	June 16, 1899.
<i>Submarine torpedo boat.</i>				
1	Plunger.....	Columbian Iron Works.....	8	In doubt.
<i>Tugs.</i>				
6	Penacook.....	Navy yard, New York.....	12	December 1, 1899.
7	Pawtucket.....	Navy yard, Mare Island, Cal...	12	" " "

Revenue and Expenditure.—The main sources of revenue in the United States are internal revenue taxes and customs. The main items of expense are the War and Navy Departments, the pension list, the civil service, and the payment of interest on the public debt. For the fiscal year ending June 30, 1898, the revenue, exclusive of the proceeds of the Pacific Railway sale, was \$340,570,112, and the expenditure, exclusive of the interest on the public debt, was \$405,783,526. For the eleven months ending Nov. 30, the total revenue was \$400,608,218.06, and the total expenditure for the same period was \$522,993,227.95. The net deficit for the year ending June 30, 1898, was \$38,047,247, as compared with \$18,052,454 at the end of the fiscal year 1896-7. The internal revenue yielded between \$24,000,000 and \$25,000,000 more in the year ending June 30, 1898, than in the preceding fiscal year, but the customs receipts fell off by nearly \$27,000,000. As compared with 1870 the revenues show a marked decrease, and the expenditures an increase.

On December 6 the Secretary of the Treasury, Hon. Lyman J. Gage, submitted his annual report on the nation's finances to Congress. The revenues and the expenditures for the fiscal year ending June 30, 1898, were as follows:

REVENUES.

From internal revenue.....	\$170,900,641.49
From customs.....	149,575,062.35
From profits on coinage, bullion deposits, etc.....	4,756,469.71
From District of Columbia.....	3,693,282.98
From fees—Consular, letters patent, and land.....	2,639,750.54
From tax on National banks.....	1,975,849.28
From sales of public lands.....	1,243,129.42
From navy pension and Navy Hospital funds.....	1,146,590.41
From miscellaneous.....	1,007,352.96
From sinking fund for Pacific Railways.....	781,086.83
From sales of Indian lands.....	576,687.41
From customs fees, fines, penalties, etc.....	576,487.50
From payment of interest by Pacific railways.....	526,286.13
From immigrant fund.....	306,992.86
From sales of government property.....	224,331.52

† The date of "probable completion" given is that named in the contract.

From deposits for surveying public lands.....	\$113,049.08
From Soldiers' Home, permanent fund.....	107,612.49
From donations	102,394.87
From sales of lands and buildings.....	99,273.95
From sales of ordnance material.....	94,638.59
From reimbursement for cost of water supply, District of Columbia	93,086.98
From depredations on public lands.....	29,154.30
From sale of Kansas Pacific Railroad.....	6,303,000.00
From sale of Union Pacific Railroad.....	58,448,223.75
From postal service.....	89,012,618.55
Total receipts	\$494,333,953.75

EXPENDITURES.

For the civil establishment, including foreign intercourse, public buildings, collecting the revenues, District of Columbia, and other miscellaneous expenses.....	\$86,016,464.75
For the military establishment, including rivers and harbors, forts, arsenals, seacoast defenses, and expenses of the Spanish war...	91,992,000.29
For the naval establishment, including construction of new vessels, machinery, armament, equipment, improvement at navy yards, and expenses of the Spanish war.....	58,823,984.80
For Indian service.....	10,994,667.70
For pensions	147,452,368.61
For interest on the public debt.....	37,585,056.23
For deficiency in postal revenues.....	10,504,040.42
For postal service.....	89,012,618.55
Total expenditures	\$532,381,201.35
Showing a deficit of.....	\$38,047,247.60

The following table shows the appropriations made during the second session of the Fifty-fifth Congress:

Titles.	Amounts.	Total.
Agricultural appropriation act.....	\$3,509,202.00	
Army appropriation act.....	23,193,392.00	
Diplomatic and consular appropriation act.....	1,752,208.76	
District of Columbia appropriation act.....	6,426,880.07	
Fortification appropriation act.....	9,377,494.00	
Indian appropriation act.....	7,673,854.90	
Legislative appropriation act.....	21,625,846.65	
Military Academy appropriation act.....	458,689.23	
Naval appropriation act.....	56,098,783.68	
Pension appropriation act.....	141,233,830.00	
Post-Office appropriation act.....	99,222,300.75	
Sundry civil appropriation act.....	48,490,212.26	
		\$419,062,694.30
Deficiency appropriation act, 1898 and prior years	234,419,401.16	
Deficiency appropriation act, Congress, etc.....	210,000.00	
Urgent deficiency appropriation act, 1898, and prior years	1,928,779.33	
Deficiency appropriation act, United States Courts, etc.....	800,000.00	
Urgent deficiency appropriation act, national defense, etc....	50,183,000.00	
Deficiency appropriation act, Army, Navy, fortifications, etc....	35,720,945.41	
Deficiency appropriation act, pensions, etc.....	8,495,264.06	
Urgent deficiency appropriation act, military and naval establishments, etc.....	18,015,000.00	
		\$349,772,389.96
Miscellaneous appropriation acts.....		6,560,311.29
Total		\$775,395,395.55
The permanent specific and indefinite appropriations for the fiscal year 1899 were estimated by the Secretary of the Treasury at....		\$117,836,220.00
Grand total		\$893,231,615.55

The Secretary estimates the revenue for the fiscal year ending June 30, 1899, as follows:

From customs	\$195,000,000.00
From internal revenue.....	270,000,000.00
From miscellaneous sources.....	20,000,000.00
From postal service.....	92,874,647.37
Total	\$577,874,647.37

The expenditures for the same period are estimated as follows:

For the civil establishment.....	\$93,000,000.00
For the military establishment.....	250,000,000.00
For the naval establishment.....	60,000,000.00
For the Indian service.....	12,000,000.00
For pensions	141,000,000.00
For interest on the public debt.....	41,000,000.00
For postal service.....	92,874,647.37
Total estimated expenditures	\$689,874,647.37
Or a deficit of.....	\$112,000,000.00

On November 1, 1897, the estimated population of the United States was 73,461,000 and the per capita supply of money outside the treasury was \$23.23. On November 1, 1898, the estimated population was 75,059,000 and the per capita supply of money \$24.87. The following table shows the changes in the currency circulation between November 1, 1897, and November 1, 1898:

	In circulation Nov. 1, 1897.	In circulation Nov. 1, 1898.	Decrease.	Increase.
Gold coin.....	\$539,373,653	\$448,846,787		\$110,526,866
Standard silver dollars.....	80,186,778	63,437,255		16,749,523
Subsidiary silver.....	63,432,629	68,878,932		5,446,303
Gold certificates.....	36,814,100	35,338,909	\$1,475,191	
Silver certificates.....	372,436,919	361,177,575	11,259,344	
Treasury notes, not July 14, 1890.....	101,759,665	96,500,780	5,258,885	
United States notes.....	258,998,998	306,301,680		47,302,682
Currency certificates, not June 6, 1872.....	48,285,000	30,064,000	18,221,000	
National bank notes.....	225,134,388	234,969,964		9,835,576
Total.....	\$1,708,722,904	\$1,896,975,788	\$188,252,884	\$194,726,239
Net increase.....				\$158,842,574

War Revenue Act.—Prominent in the war measures was the War Revenue Act, which was approved on June 13, 1898. It had been introduced for the purpose of providing ways and means to meet war expenditures. Before its passage Congress had enacted a law on March 8, appropriating \$50,000,000 for the purposes of national defense. Many changes were offered to the War Revenue bill and some important changes were made in it. It was passed in the House by a majority of 181 to 131 by what seemed to be nearly a party vote, only six Democrats voting for the bill and only two Gold Republicans against it. The Populists and Silver Republicans voted against it. In the Senate an amendment was inserted for the issue of greenbacks, and for the coinage of the silver bullion then held in the Treasury to the amount of not less than \$4,000,000 per month, and the Secretary of the Treasury was authorized and directed to issue silver certificates to the amount of the gain or seigniorage derived from the purchase of silver bullion by the Treasury under the act of July 14, 1890, until the sum of \$42,000,000 should have been issued. As amended in the Senate the measure contained a clause authorizing the Secretary of the Treasury to borrow money at a rate of interest not exceeding three per cent. and to issue therefor certificates of indebtedness to be offered whenever practicable at public subscription, and also authorizing him to borrow on the credit of the United States from time to time as the proceeds might be required to defray the expenditures necessary on account of the war, the sum of \$300,000,000 issuing bonds for the same in denominations of \$25 or some multiple of that sum, redeemable in coin at the Treasury of the United States after ten years from the date of their issue, and payable twenty years from such date, and bearing interest at the rate of three per cent. per annum. The bond issue, also, was to be offered as a public loan. The bill thus amended was discussed in a conference with the two Houses, and a compromise measure, slightly

altering the Senate provision for the coinage of the seigniorage and increasing the limit of the bond issue from \$300,000,000 to \$400,000,000, was adopted by the conference and accepted in the Senate by a vote of 43 to 22, 16 Democrats, 3 Silver Republicans and 3 Populists voting in the negative; and in the House by a vote of 154 to 107, 5 Democrats voting in the affirmative, and 2 Republicans in the negative.

The War Taxes.—Besides the provisions already mentioned, the law imposed a number of new taxes and increased some on articles already taxed. Space will not permit the enumeration of all these changes in the tax schedule, but among the important features were the tax on fermented liquors of \$2 a barrel; the introduction of a large number of stamp taxes including taxes on bonds, debentures, or certificates of stock and indebtedness, on sales or agreements to sell stock or products, on bank checks, drafts, certificates of deposit, on bills of exchange, domestic and foreign, on bills of lading, telephone messages, etc. Among the other important taxes were those on tobacco, cigars, cigarettes, and snuff; the special annual taxes upon bankers, brokers, pawn-brokers, proprietors of theatres, museums, concert halls, circuses, and other public exhibitions or places of amusements, the taxes on charter contracts or agreements, or renewals or transfers, including insurance policies, leases, mortgages, manifests for entry or clearances of vessels, power of attorney, protests of states, warehouse receipts, etc.; also various excise taxes, taxes on legacies and distributive shares of personal property; and finally in the department of customs duties, a tax of 10 cents per pound on tea, imported from foreign countries.

The call for subscriptions to the loan met with a prompt and hearty response, the amount subscribed being many times that which was required. A further discussion of the financial measures necessitated by the war will be found in the article SPANISH AMERICAN WAR. The customs duty on tea, the tax on tobacco, cigars, cigarettes, and snuff, and on fermented liquors went into effect upon the passage of the act, but the other sections did not go into operation until July 1, so that their effect upon the revenues cannot be seen in the figures for the fiscal year. But it will be noticed from the figures given above for the eleven months ending Nov. 30, that the deficit at that date was even greater than on June 30. The receipts from the Dingley tariff were disappointing, being for the fiscal year 1898 only \$149,575,062, less than they had been for any fiscal year since 1894. The expense of the pension list was exceedingly large. See the article PENSIONS.

Customs Receipts.—As to the revenue-yielding character of the tariff it would be unfair to take the fiscal year ending June 30, 1898, as a criterion because the customs receipts were abnormally low on account of a falling off in the importations immediately after the enactment of the Dingley tariff law of July 24, 1897. But a statement issued by the Bureau of Statistics shows that for the calendar year 1898 the receipts from the Dingley tariff act together with internal revenue and miscellaneous receipts, exceeded the ordinary daily expenditures before the extraordinary expenditures incident to the war began. The customs receipts for the calendar year 1898 were \$182,879,361. The following table shows the receipts from customs, internal revenue and miscellaneous sources, the extraordinary receipts and the ordinary receipts per diem as compared with the ordinary per diem expenditure of 1893-1897:

Total Receipts, Calendar Year 1898.

Customs	\$182,879,361
Internal revenue	222,922,310
Miscellaneous	36,829,580
Total	\$442,631,251

Total Extraordinary Receipts From War Revenue and Miscellaneous, Calendar Year 1898.

Customs (tea duty).....	\$2,079,787
Internal revenue (war-revenue act).....	55,286,831
Pacific Railroad	14,841,401
Total	\$72,208,019

Ordinary Receipts (Omitting War Revenue and Pacific Railroad), Calendar Year 1898.

Total receipts of year.....	\$442,631,251
War revenue and Pacific Railroad.....	72,208,019
Total ordinary	\$370,423,232

Ordinary Receipts of 1898, Compared With Ordinary Expenditures of 1893-1897.

Average daily (ordinary) receipts calendar year 1898.....	\$1,014,860
Average daily expenditures, 1893-1897.....	1,000,083
See TARIFF OF THE UNITED STATES.	

Returns From the War Revenue Measures.—The expenditures on account of the war were largely increased before the close of the fiscal year, and during the four succeeding months the expenditures of the War Department were greater by \$81,513,131.40 than for the same months in 1897, and of the Navy Department the expenditures exceeded those for the same period in 1897 by \$16,014,926. The receipts from the internal revenue began to come in immediately after the passage of the act (June 13, 1898), and the Treasury also acquired money rapidly from the popular loan. It was clear from the report of the Commissioner of Internal Revenue that the internal revenue tax would yield a smaller total than had been expected. He estimated the yield from this source at \$100,000,000. Much inconvenience was caused by the obscure wording of the act and the interpretation of some of its clauses occasioned considerable complaint. As to the new bond issue it was in every way successful. When the bill was reported the market was already in a somewhat excited condition owing to the war. The rate of interest rose and the price of securities fell. Some timid depositors withdrew their funds from the savings banks and in the larger cities the commercial banks also suffered to some extent. The old issues of government bonds fell slightly, yielding an interest on the investment of from 3.1 to 3.25 per cent. These conditions did not seem to be favorable to the successful negotiation of the loan at 3 per cent. At the same time the issue of the new bonds offered an inducement to the national banks for the taking out of a larger circulation, since the old issues though nominally paying a higher rate of interest, were at so high a premium that it was more profitable for the banks to purchase 3 per cent. bonds at par. Under existing conditions the national banks were within the limit of their circulation to the extent of \$400,000,000. These considerations increased the demand for the bonds and the Secretary of the Treasury states that at the very moment when the act was approved the whole amount of the first issue, namely, \$200,000,000, could have been sold at a premium of probably 2½ per cent. But the act required that the bonds should be first offered at par as a popular loan in such a way as to give the citizens of the United States a chance to subscribe. So the Treasury Department tried by every means in its power to give the public opportunities to subscribe. Its success appears from the fact that of the 325,000 persons that subscribed to the issue of \$200,000,000 in bonds over 232,000 subscribed for sums of \$500 and less. See succeeding paragraph on Cost of the War.

Operations of the Treasury.—The net deficit according to official figures for the fiscal year 1898 was \$61,948,849.60, not including, however, any part of the \$200,000,000 loan, although receipts from that source had begun to come in before the close of the year. An extraordinary source of revenue during the year was the proceeds from the sale of the Union Pacific and Kansas Pacific railroads. The assets of the Treasury showed an improved condition. There was an increase in the gold holdings and in the deposits with the national banks, and a falling off in silver and in Treasury notes. The gold holdings steadily increased from the beginning of the year until they reached their highest point in May. After that the disbursements on account of the war brought down the gold reserves somewhat, but as the proceeds of the loan came in, and as the war drew to an end, the reserves increased, and on October 7, 1898, reached \$245,063,795.51, the highest point that they had ever attained. The proceeds of the popular loan began to come in on the 14th of June, and continued steadily from that date onward until by November 1, 1898, \$195,444,187.62 out of a total of \$200,000,000 had been received.

The National Debt.—The following table shows the amount and classification of the debt on Dec. 31, 1898:

Interest-bearing debt	\$1,040,215,980.00
Debt on which interest has ceased since maturity.....	1,237,200.26
Debt bearing no interest.....	382,487,801.04
<hr/>	
Aggregate of interest and non-interest-bearing debt.....	\$1,423,940,981.00
Certificates and Treasury notes offset by an equal amount of cash in the Treasury.....	553,447,783.00
<hr/>	
Aggregate of debt, including certificates and Treasury notes.	\$1,977,388,764.00

The following table shows the amount and classification of the cash in the Treasury on Dec. 31, 1898:

CLASSIFICATION.				
Gold :				
Coin	\$139,654,545.39			
Bars	142,074,889.39			
			\$281,729,434.78	
Silver :				
Dollars.	405,081,304.00			
Subsidiary coin.....	5,959,842.79			
Bars.....	92,192,207.48			
			508,312,854.27	
Paper :				
United States notes	34,265,278.00			
Treasury notes of 1890.....	1,580,539.00			
Gold certificates.....	1,608,740.00			
Silver certificates.....	7,098,509.00			
Certificates of deposit, act of June 8, 1872.....	220,000.00			
National bank notes.....	5,480,140.84			
			50,258,206.84	
Other :				
Bonds, interest and coupons paid, awaiting re- imbursement.....	35,667.50			
Minor coin and fractional currency.....	339,271.54			
Deposits in national bank depositaries—				
General account.....	89,388,177.40			
Disbursing officers' balances.....	5,472,738.91			
			95,235,855.85	
Aggregate.....	.....		.....	\$980,431,351.24

DEMAND LIABILITIES.				
Gold certificates.....	36,808,999.00			
Silver certificates.....	399,430,504.00			
Certificates of deposit, act of June 8, 1872.....	20,685,000.00			
Treasury notes of 1890.....	96,523,280.00			
			558,447,783.00	
Fund for redemption of uncurrent national bank notes	9,451,180.00			
Outstanding checks and drafts.....	8,929,435.06			
Disbursing officers' balances	61,375,347.69			
Agency accounts, etc.....	7,462,909.45			
			82,218,872.82	
Gold reserve.....	100,000,000.00			
Net cash balance.....	194,764,695.42			
			294,764,695.42	
Aggregate.....	.....		.....	980,431.351. 2

Cash balance in the Treasury, November 30, 1898.....	\$292,376,790.35
Cash balance in the Treasury, December 31, 1898.....	294,764,695.42
Decrease during the month	\$2,387,905.07

Currency.—Some account is given of currency questions in the United States in the article CURRENCY REFORM (q. v.), and of the part which the United States has recently played in the history of the bimetallist movement in the article BIMETALLISM (q. v.). For the production of gold and silver in the United States see the articles GOLD and SILVER. In the year 1898, which in many respects was the most remarkable year in the financial history of the country, the deposits of gold bullion at the mints and assay offices were the largest ever recorded, being for the fiscal year ending June 30, 1898, \$147,693,194.83, exclusive of re-deposits, as against \$87,300,337.71 in the previous year. The largest amount of refined bullion received from any foreign country was from England, and of unrefined bullion, from Mexico. During the fiscal year the import of gold was higher than was ever before recorded, being \$120,391,674. The total gold exports from the United States during the fiscal year, on the other hand, were only \$15,533,719. The exports of United States gold coin during the fiscal year were lower than they had been in any previous year since 1890. As to the coinage, there was an increase in the amount of gold coins, subsidiary silver coins and minor coins in the fiscal year 1898 as compared with the previous year, but a decrease in the coinage of silver dollars. The following table, taken from the report of the Director of the Mint, shows the coinage for the fiscal year 1898:

Denomination.	Pieces.	Value.
Gold.		
Double eagles	2,348,723	\$46,974,460.00
Eagles	993,162	9,931,620.00
Half eagles	1,536,067	7,680,335.00
Quarter eagles	19,380	48,450.00
Total gold	4,897,332	\$64,634,865.00

Denomination.	Pieces.	Value.
Silver.		
Standard dollars	10,002,780	10,002,780.00
Subsidiary.		
Half dollars	4,787,652	2,393,826.00
Quarter dollars	10,579,600	2,644,900.00
Dimes	14,440,780	1,444,078.00
Total subsidiary	29,808,032	\$6,482,804.00
Total silver	39,810,812	\$16,485,584.00
Five cents	19,015,343	950,767.15
One cent	53,871,696	538,716.96
Total minor	72,887,039	\$1,489,484.11
Total coinage.....	117,595,183	\$82,609,933.11

On June 30, 1898, the amount of money in circulation in the United States was higher than at any previous time, being \$1,843,435,749, and at the close of the calendar year this amount was larger still. The following table shows the amounts and the different kinds of currency in circulation, and their total on January 1, 1899:

Gold coin	\$667,796,579
Silver, Standard dollars.....	65,183,553
Subsidiary	70,627,818
Notes, United States.....	312,415,738
Treasury, act of July 14, 1890.....	94,942,741
National bank	238,337,729
Certificates, Gold.....	35,200,259
Silver	392,331,995
Currency	20,465,000
Total	\$1,897,301,412

Banking.—On September 20, 1898, a report was made on the condition of national banks. From this it appears that the number of national banks in operation was less than at any date of report since December 19, 1890, but that the amount of individual deposits, loans, discounts, and total resources reached the highest point ever attained in the history of the national banks. The increase in the total resources between October 5, 1897, and September 20, 1898, was nearly \$300,000,000. The following table gives a summary of the reports on the condition of the national banks between December, 1897, and September, 1898:

RESOURCES.	Dec. 15, 1897.	Feb. 18, 1898.	May 5, 1898.	July 14, 1898.	Sept. 20, 1898.
	3,607 banks.	3,594 banks.	3,586 banks.	3,582 banks.	3,585 banks.
Loans and discounts.....	\$2,082,608,824.81	\$2,136,078,280.43	\$2,097,094,235.23	\$2,151,757,655.60	\$2,155,961,627.91
Overdrafts.....	17,741,998.50	14,093,400.41	12,679,151.37	11,924,282.56	16,557,942.63
U. S. bonds to secure circulation.....	222,020,750.00	212,425,300.00	218,158,300.00	218,106,450.00	224,628,540.00
U. S. bonds to secure U. S. deposits.....	45,367,100.00	84,760,500.00	28,630,500.00	53,519,100.00	83,928,200.00
U. S. bonds on hand..	14,915,800.00	13,184,500.00	16,365,000.00	18,731,350.00	30,614,010.00
Premiums on U. S. bonds.....	18,555,489.01	17,789,744.59	18,271,547.14	18,947,195.10	18,971,197.22
Stocks, securities, etc.	217,582,980.50	230,846,748.92	236,025,116.53	250,689,375.09	255,198,927.29
Banking house, furniture and fixtures.	79,234,940.92	78,894,056.33	79,463,235.21	79,308,604.63	79,386,337.21
Other real estate and mortgages owned...	29,852,102.09	30,119,511.21	30,328,045.27	30,186,270.70	30,484,417.71
Due from national banks.....	168,825,189.92	170,808,109.97	152,372,153.15	161,128,722.49	159,128,045.17
Due from State banks and bankers	48,012,496.55	48,093,430.84	45,468,995.03	43,248,800.85	46,324,678.06
Due from approved reserve agents.....	309,569,861.34	300,277,020.45	300,961,618.98	320,015,065.43	320,002,091.90
Checks and other cash items	14,933,428.42	13,100,061.68	16,719,876.27	17,308,976.92	16,828,942.11
Exchanges for clearing house	118,415,888.07	113,590,539.43	126,234,933.64	94,276,408.07	110,256,965.35
Bills of other national banks.....	18,869,116.00	18,600,745.00	21,338,292.00	20,811,692.00	19,649,720.00

RESOURCES.	Dec. 15, 1897.	Feb. 18, 1898.	May 5, 1898.	July 14, 1898.	Sept. 20, 1898.
	8,607 banks.	8,594 banks.	8,586 banks.	8,582 banks.	8,585 banks.
Fractional currency, nickels, and cents..	\$925,465.16	\$1,040,901.78	\$1,057,060.71	\$1,098,904.16	\$1,023,834.08
Gold coin.....	119,747,644.72	125,710,166.77	131,081,263.68	132,888,037.43	127,990,555.98
Gold Treasury certificates.....	19,484,500.00	18,062,350.00	18,230,690.00	18,457,340.00	18,323,870.00
Gold clearing-house certificates.....	67,861,000.00	79,083,000.00	118,833,000.00	133,576,000.00	104,358,000.00
Silver dollars.....	7,509,247.00	7,459,428.00	8,100,544.00	7,963,587.00	8,861,433.00
Silver Treasury certificates.....	31,752,596.00	34,964,239.00	35,816,796.00	33,458,014.00	30,679,950.00
Silver coin, fractional.	5,808,565.21	6,068,741.84	6,120,479.16	6,384,152.52	5,662,849.41
Legal-tender notes...	112,564,875.00	120,265,185.00	119,058,681.00	114,914,997.00	110,038,300.00
U. S. certificates of deposit.....	45,840,000.00	49,250,000.00	23,975,000.00	20,885,000.00	16,810,000.00
Five per cent. redemption fund.....	9,761,568.38	9,315,860.62	9,520,530.82	9,601,066.56	9,795,055.25
Due from Treasurer United States.....	1,442,901.40	1,535,292.19	1,064,313.04	11,063,427.06	4,019,551.74
Total.....	\$3,829,213,776.00	\$3,946,947,114.41	\$3,869,966,858.21	\$3,977,675,445.17	\$4,008,511,044.87

LIABILITIES.

Capital stock paid in.	\$629,655,365.00	\$628,890,320.00	\$624,471,670.00	\$622,016,745.00	\$621,517,895.00
Surplus fund.....	246,416,688.48	248,484,530.31	247,685,979.44	247,935,215.65	247,555,108.57
Undivided profits, less expenses and taxes.....	95,298,663.02	86,143,789.31	90,320,999.16	85,066,427.50	93,015,097.80
National bank notes outstanding.....	198,783,985.00	184,106,322.00	188,425,308.50	189,866,298.50	194,483,765.50
State bank notes outstanding.....	60,335.50	56,018.50	56,017.50	56,007.50	55,907.50
Due to other national banks.....	445,061,154.89	504,980,175.82	424,204,634.90	467,634,068.18	446,417,454.05
Due to State banks and bankers.....	232,877,508.25	259,972,293.60	245,648,049.17	262,182,778.37	51,917,900.89
Dividends unpaid....	943,274.07	1,071,997.92	2,000,238.18	2,704,832.25	1,008,410.82
Individual deposits...	1,916,630,252.25	1,982,660,933.15	1,999,308,438.96	2,083,357,159.60	2,131,454,540.29
U. S. deposits.....	39,939,047.71	27,562,931.73	23,005,935.89	48,061,088.95	70,187,868.12
Deposits of U. S. disbursing officers....	4,012,185.36	3,870,885.81	3,928,661.49	4,788,377.83	4,977,832.80
Notes and bills rediscounted.....	3,161,796.07	2,681,072.89	4,467,622.85	5,264,952.85	6,084,815.45
Bills payable.....	7,722,623.78	5,579,549.06	9,288,156.89	9,283,285.11	11,283,332.33
Liabilities other than those above.....	13,655,901.62	10,866,844.31	7,060,145.28	19,368,262.88	23,551,615.69
Total.....	\$3,829,213,776.00	\$3,946,947,114.41	\$3,869,966,858.21	\$3,977,675,445.17	\$4,008,511,044.87

On Oct. 31, 1898, there were 3,598 national banks in operation and 1,553 in liquidation. The active banks had aggregate capital, \$624,324,142; outstanding circulation, \$239,629,136; deposits, \$2,479,687,044; reserve, \$750,519,564. State banks numbered 3,965, and had aggregate capital, \$233,587,353; deposits, \$912,365,406; resources, \$1,356,084,800; surplus, \$81,290,239. There were 246 loan and trust companies, with capital, \$101,228,555; deposits, \$662,138,397; resources, \$942,462,179; surplus, \$70,658,684. Private banks numbered 758, and had capital, \$16,721,750; deposits, \$62,085,084; resources, \$91,436,387; surplus, \$3,071,204. Of savings banks there were 659 mutual, which had 4,835,138 depositors, \$1,824,963,410 deposits, \$2,005,950,646 resources, and \$153,431,884 surplus, and 275 stock, which had \$18,536,130 capital, 403,743 depositors, \$202,274,433 deposits, \$235,394,345 resources, and \$9,049,512 surplus. Combining all these institutions gave a total banking capital of \$994,397,930, and deposits of \$6,143,513,774. At 75 clearing houses in the country the exchanges in the year ending Sept. 30, 1898, aggregated \$65,924,820,769, showing an increase of \$11,745,375,739 in a year.

The reports of the Secretary of the Treasury and the Comptroller of the Currency both discuss the need of improving the national banking system in such a way as to provide an elastic currency and to remove the strain upon the government gold reserves. This discussion, however, falls more properly under the head of CURRENCY REFORM. Some account of the proposed measures for improving the currency system will be found in that article, and in the article BANK-BANKING.

The Stock Market.—During the year 1898 the United States made its highest record in the amount of its exports of merchandise, imports of gold, money in circulation, holdings of gold in the Treasury, bank loans and deposits, stock exchange transactions, clearing-house exchanges, and iron, cotton and gold production. We

are, therefore, justified in regarding the year as most exceptional from the financial point of view. It will not be possible here to give its record in detail, but a few points may be noted. In the first place, the comparative figures of stock exchange transactions show an amazing increase over previous years. At the beginning of the year the stock market showed confidence, but there were already signs of distrust on account of the Cuban question. In February there was a strong market, but as the Cuban difficulty drew nearer, its effect showed itself in a somewhat sudden fall in values, and the decline continued until the end of March. On March 26, the lowest prices of the year were reached in the case of a majority of stocks, and, for a short time there was some apprehension of a panic among the more nervous. The weakness of the market continued until after the declaration of war, but Dewey's victory at Manila was followed by a period of buoyancy which, though interrupted by occasional short intervals of depression in consequence of unfavorable war rumors, was strengthened by the news of recurring American victories. The failure of Mr. Leiter's great scheme for cornering the wheat market led to some heavy sales, but prices soon rallied. In July the expectation of a favorable peace strengthened the market, and after the surrender of Santiago there was a decidedly buoyant feeling. Some encouragement, however, was afforded to the "bears" by the falling off of the surplus reserves in the New York banks on account of the payments to the government for the bond issue and the withdrawal of currency by Western banks at the time of the moving of the crops. In September there was a downward tendency on account of a slight stringency in the money market. But toward the end of the month the weekly bank statement showed an increase in the surplus reserve, and from this time there was a strong and active market, the months of November and December being exceptional for the buoyancy displayed in every department of trade. The year closed with this activity at its height, and the boom seemed to many competent observers to rest on a genuine basis, and not to be the result of over-confidence. The official figures of the New York Stock Exchange during the year 1898 are, shares, 113,470,383, and bonds, \$918,028,710. The number of shares exchanged was surpassed only by that of the year 1882. The clearing house exchanges reached their highest point in the month of December, 1898, being \$7,357,200,511, for the entire country, and \$4,657,357,808 for New York. The deposits of the national banks reached their highest point on September 20, 1898, being \$2,031,454,540, including only individual deposits. The cash in the national bank reserves was \$470,977,127 on July 14, 1898. The gold in circulation in the United States reached its highest point on July 1, 1898, being \$696,780,519; the gold in the United States Treasury on December 31, 1898, being \$246,973,026.

HISTORY.

Congress.—The second session of the Fifty-fifth Congress met on December 6, 1897. The President's Message was submitted on the opening day of the session. It gave the first place to the question of currency reform, favoring the plan proposed by Secretary Gage. (See the article CURRENCY REFORM.) It discussed the Cuban question in some detail outlining the course that the administration had taken in respect to Cuba. The President said that for many years the condition of the island had been such as to cause annoyance and alarm in the United States. The existing war in Cuba was carried on by both sides without regard to the code of war recognized by civilized nations. He referred to the cruel policy of reconcentration adopted on February 18, 1896, saying that it had resulted in laying waste the lands of the agricultural inhabitants and in destroying their dwellings. He characterized it as an uncivilized mode of warfare and a failure as a war measure. He announced that the minister to Spain, Mr. Woodford, had been instructed to ask that country to take steps toward the restoration of order on a basis honorable to Spain and Cuba alike, and that in response the Sagasta government had declared its purpose to establish autonomy in Cuba, and further stated that the United States would materially aid in the restoration of peace if it enforced its neutral obligations. The President did not think that the time had come for the recognition of the insurgents as belligerents or as independent, nor for an intervention which would result in war, but he favored a neutral intervention looking to a compromise between the insurgents and the Spanish government. He said, however, that it was due to Spain that she should have a reasonable chance to carry out the plan which she proposed and he referred to the fact that she had recalled a general whose name was associated with cruelty in the prosecution of the war and had mitigated the rigors of reconcentration. Further commenting on foreign affairs he referred to the importance of Hawaiian annexation, told what had been done towards the establishment of international bimetallism, and described the negotiations that had been carried on under the Dingley act for reciprocity. In regard to domestic affairs he advocated the improvement of docking facilities to meet the needs of the increased navy, and recommended the building of an additional battle-ship for the Pacific, and of additional torpedo boats. Among the other topics treated in the message were the condition of affairs in the Indian Ter-

ritory, and the question whether the government should purchase property of the Kansas Pacific Railway under its mortgage. Down to the time when the Cuban crisis occupied the attention of Congress comparatively little important legislation was considered. The measure known as the Lodge Immigration Bill for the application of an additional test to aliens entering this country was passed by the Senate, but no action was taken in the House until December, 1898, when it was defeated. (See article IMMIGRATION.) The currency question came up early in the session, Senator Teller of Colorado, having introduced a resolution on January 20, providing for the payment of both principal and interest of United States bonds at the option of the government of the United States in standard silver dollars. The Senate passed this measure on Jan. 28, but it was promptly thrown out in the House. Senator Wolcott's speech on January 17, drew the popular attention again to the bimetallic mission of the Secretary of 1897. For some account of these matters see the articles BIMETALLISM and CURRENCY REFORM. Another important measure introduced early in the session was the Loud Postal bill, which sought to correct some of the alleged abuses of the postal service and prevent the constant increase of the deficit by raising the rate on second-class matter. It occasioned long discussion but was defeated in March. On March 16, the Committee on Foreign Relations reported the joint resolution for the annexation of Hawaii, but the Cuban question was already absorbing public attention and no action was taken in respect to this matter. See the article HAWAII.

Cabinet and Other Important Changes.—In December, 1897, the cabinet officers were as follows: Secretary of State, John Sherman, of Ohio; Secretary of the Treasury, Lyman J. Gage, of Illinois; Secretary of War, Russell A. Alger, of Michigan; Attorney-General, Joseph McKenna, of California; Post-Master-General, James A. Gary, of Maryland; Secretary of the Navy, John J. Long, of Massachusetts; Secretary of the Interior, Cornelius N. Bliss, of New York; Secretary of Agriculture, James Wilson, of Iowa. In December Attorney-General McKenna was appointed Associate Justice of the Supreme Court, and John W. Griggs, of New Jersey, was appointed to his place in the Cabinet. Another important cabinet change occurred immediately after the outbreak of the war when Secretary Sherman resigned in consequence of failing health, and was succeeded by William R. Day, of Ohio, who as Assistant-Secretary of State had already performed the most important duties of the department. The position of Assistant-Secretary made vacant by Mr. Day was filled by Prof. John Bassett Moore, of Columbia University, New York. Before this Postmaster-General Gary had resigned and was succeeded by Charles E. Smith, of Pennsylvania. Secretary Cornelius M. Bliss resigned and was succeeded on December 21 by Mr. Ethan Allen Hitchcock, of Missouri. On Sept. 16, Secretary W. R. Day resigned to become a member of the Peace Commission, and his place as Secretary of State was filled by Mr. John Hay, Ambassador to Great Britain. Prof. J. B. Moore was appointed Secretary of the Commission and his place as Assistant Secretary of State was filled by Mr. D. J. Hill, of New York. In place of Mr. Theodore Roosevelt, who resigned to become Lieutenant-Colonel of the 1st Cavalry Regiment of Volunteers, known as the "Rough Riders," Mr. C. H. Allen, of Massachusetts, was appointed First Assistant Secretary of the Navy.

The Cuban Question.—The chief object of President McKinley's policy in Cuba appeared to be to improve the condition of the reconcentrados while waiting for Spain to carry out her proposed reforms in the administration of the island. The kind of autonomy offered by Spain was not acceptable to the insurgents (see the article SPANISH-AMERICAN WAR), and it was soon declared that peace could not be patched upon such a basis. Reports from Consul-General Lee and other consular agents of the United States showed that a horrible condition prevailed among the victims of the decree of reconcentration, and that the means of relief both public and private were wholly inadequate. The "Central Cuban Relief Committee" was established with headquarters at New York and supplies were regularly forwarded and distributed. Down to the end of March when the danger of war put a stop to the sending of these supplies it was estimated that they aggregated two thousand tons, and that \$180,000 in cash had been raised besides. In the meanwhile the reports of the suffering among the reconcentrados continued and in spite of the fact that the Captain-General of Cuba had said several months before that everything was being done to ameliorate their condition, matters seemed to be going from bad to worse. Senator Proctor, who visited Cuba in February, confirmed in his report some of the worst stories that had been told of Cuban destitution and suffering. The dispassionate tone of the speech which he delivered in the Senate on March 17, added greatly to the impression which his account of the matter made upon the public mind. He dwelt upon the lack of efficiency shown by the Spanish military force and held that Cuban independence was the only solution of the problem. In the meanwhile, on February 15 had occurred one of the events which tended to arouse public feeling and make war inevitable. The United States battleship *Maine* was blown up in the harbor of Havana under circumstances which naturally threw suspicion upon the Span-

iards. An account of this affair and the other events of the war will be found in the article **SPANISH-AMERICAN WAR**. The present article is concerned only with public events in the United States, and especially with the legislation of Congress. The resignation of Señor de Lome after the publication of a private letter of his containing remarks disparaging to the administration added to the tension of public feeling in spite of Spain's expression of regret for his misconduct and the appointing of Señor Polo y Benabe as his successor. On March 28, the report of the Naval Court of Inquiry appointed by the President to ascertain the cause of the explosion further fired the popular mind by attributing the destruction of the ship to an external cause. Both before and after this date there were exciting debates in Congress ranging over every aspect of the Cuban question, the de Lome affair and the explosion of the *Maine*. In the Senate, especially, impatience was shown at the slowness of the administration. In some quarters it was feared that the administration would not be sufficiently aggressive, and in others that it would act unfairly towards Spain under the pressure of popular excitement. Senator Mason advocated on February 18, the conduct of a separate investigation into the *Maine* affair by joint committee of both Houses, hinting that the Navy Department investigation was likely to show a lack of thoroughness, and that those who took part in it would naturally be under the temptation of shielding the naval officers from blame. On the other hand it was reported with some spirit that the people of the United States had the fullest confidence in every department of the government, and in the Navy Department especially. The President submitted the report of the *Maine* Board of Inquiry to Congress, accompanying it with a message in which, without commenting upon the merits of the case, he merely summarized the report and announced that he had referred it to the Spanish government. At the same time the administration was notified that the Spanish inquiry into the cause of the disaster had found that it was due to an interior explosion.

Diplomatic Negotiations.—The negotiations with Spain in respect to the Cuban difficulty had been going on during the winter and by this time had reached a deadlock. On March 27, the President appeared to have decided that it was time to put an end once for all to the war in Cuba. He accordingly made the following proposals to Spain: In the first place, there should be an armistice until October 1, in order that through the good offices of the President of the United States peace might be negotiated; in the second place, the reconcentration decree should be revoked and the "reconcentrados" restored to their homes; in the third place, relief should be afforded to them by the distribution of the needed supplies from the United States with the coöperation of the Spanish authorities. To these demands Spain promptly replied with an offer to entrust the negotiation of peace to the Cuban autonomous parliament which was to meet on May 4. It also agreed to a cessation of hostilities if the insurgents requested it, declared that the reconcentration orders had already been revoked and offered to submit the question of the *Maine* explosion to arbitration. While this was going on the people of the United States were in a condition of suspense. On April 1 it was officially given out that the President considered the Spanish reply unsatisfactory and was to submit the whole matter to Congress. There followed a delay of ten days which was attributed in part to the request of Consul-General Lee that time should be given for American citizens to leave Cuba. The President's message was submitted to Congress on April 11. In the meanwhile several important events had occurred. In the first place the autonomous Cuban government appealed to the President, stating that the majority of the free people of Cuba approved that form of government and protesting against interference from the United States. In the second place a representative of the insurgent government declared that interference on the part of the United States without a previous recognition of the Cuban republic would be regarded by the insurgents as a hostile act; thirdly, the representatives of six great European powers presented to the government in Washington a joint note expressing the hope that peace might be maintained by further negotiations; fourthly, on April 10, Spain declared an unconditional armistice in Cuba. On April 11, President McKinley's message was submitted to Congress with extensive extracts from the Consular Reports on Cuba. The important part of the text of the message is given in the article **SPANISH-AMERICAN WAR**. The President declared that the war in Cuba must stop, and asked Congress to empower him to take steps to bring this about, and secure a suitable government in Cuba. Then followed the debate in Congress on the message and the final adoption on April 19 of the joint resolutions declaring the independence of Cuba, demanding that Spain relinquish its authority of government there, directing and empowering the President to enforce the resolutions, and disclaiming any intent on the part of the United States to exercise sovereignty over the island except for its pacification. The joint resolutions were approved by the President and on the following day an ultimatum was sent to Spain. Hostilities at once began and on April 25, Congress decided that war had existed since April 21.

The Responsibility for the War.—In the United States a small but conspicuous

minority had actively opposed the war, and continued to criticise the policy of this government after war had begun. Their opposition rested on a variety of grounds, chief among which was a belief that intervention in Cuba was not justified, that Spain had not had a chance to carry out plans which had been proposed, ostensibly in good faith; that the *Maine* disaster had had an undue influence on popular opinion in the United States; that to the moment of the declaration of war there was no aspect of the situation which rendered a peaceful adjustment hopeless. As to the question of intervention conservative opinion did not fail to find a justification in precedents as well as in theory. The intervention of one State in the affairs of another had frequently occurred and when its motive was humanity or self-defense, it was recognized as just, although no precise rules determining what constituted a just ground of intervention had been laid down by publicists. In the case of Cuba intervention was justified, not from motives of humanity alone, but because the interests of the United States were involved. Damage to property and trade had been caused by war carried on so near the borders of this country. The methods of warfare were barbarous, and the war appeared to be one of extermination. It had continued for a long time and there was as yet no sign that the end was near. Such was the attitude even of conservative people in the United States, and in spite of the character and influences of the opponents of the war it is probable that in no previous war in which this country has engaged has the approval of the people been so nearly unanimous. On the other hand, the position of Spain is not hard to understand. It was known there that since the beginning of the Cuban revolt the prevailing sentiment in this country had been in favor of the insurgents, and though the official attitude of the United States government was friendly, it was inevitable that the violent and abusive remarks made in Congress and the press should influence Spanish opinion. It was known in Spain that military supplies were dispatched to Cuba from this country; that the headquarters of the Cuban insurgents were in the United States; that filibustering expeditions evaded the vigilance of our authorities and effected a landing in Cuba; and that when those who participated in such expeditions were brought to trial, not all of them were convicted. It was natural that the Spanish government should believe the government of the United States to be lukewarm in its professed desire to pursue a friendly policy. On these points, however, it should be noted that the mere existence of a hostile sentiment in this country did not justify the imputation of hostility to the government. Against the fitting out of filibustering expeditions, the United States authorities appear to have taken all possible precautions. The report of the Commissioner of Navigation states that from April 15, 1895, for nearly three years the Board of Navigation was sending almost daily instructions to United States officers in regard to the enforcement of neutrality laws and the prevention of filibustering expeditions to Cuba in violation of these laws, and that the latest instructions on this subject were issued on March 28, 1898. He adds that in results attained the enforcement of the neutrality laws will compare favorably with the enforcement of neutrality by any other nation at any time of late years in a position at all analogous to that of the United States. As to the sale on the part of individuals in the United States of war material to the Cuban insurgents, that is a lawful trade, and the duty of preventing it devolved upon Spain. Our extensive seaboard made the prevention of filibustering expeditions a work of great difficulty, but there is no evidence that the United States authorities were lacking in due diligence. In regard to the influence that the *Maine* affair had upon public opinion, it is admitted that the legal course would have been to suspend judgment until the matter had been arbitrated. But it is questionable if such a course would have been followed by any other nation in the same circumstances, and to many it was a matter of surprise that the people of the United States showed so much patience and self-restraint pending the report of the board of inquiry. An American writer on international law says: "Suppose, after the German Kaiser had stirred England to its centre by putting his finger into the Transvaal mess, an English ship of war had been sunk in Kiel or Bremen harbor by an explosion apparently from an outside source. Is it probable that the delicate balance of responsibility for the loss, with a financial indemnity tacked on, would have been calmly argued or arbitrated, and national passion choked down?"

The United States and Neutrals.—The first act of the war was the capture of a Spanish vessel by the gunboat *Nashville* on April 22. The United States government immediately defined, in a note addressed to foreign powers, the attitude which it would adopt toward privateering and neutrals. It declared that it would abide by the principles of the Declaration of Paris of 1856, which provided for the cessation of privateering, the security of neutral goods under an enemy's flag, and enemy's goods under a neutral flag, if not contraband of war, and laid down the rule that a blockade to be binding must be effective. On April 24, Spain defined her position in substantially the same terms except that she reserved the right of privateering, though stating that for the present only armored cruisers should be employed for that purpose. In adopting this course Spain sacrificed more than the United States, for

the latter country had impliedly accepted the rules of the Declaration of Paris with the exception of that relating to privateering, and had incorporated them in treaties with foreign powers. Moreover, the United States had more effective means of injuring Spain at her disposal than by destroying Spanish commerce. But Spain, in issuing this declaration, gave up very important means of harassing the United States. She did not sign the Declaration of Paris, and had a legal right to make war upon our commerce. Had she insisted upon this right and seized the goods of American owners borne by neutral vessels, there is no doubt that heavy losses would have been inflicted upon our trade with the probable result of arousing opposition to the war on the part of those classes of our population who sustained the injury. Neutrality proclamations were issued by foreign powers, beginning with Great Britain on April 26. By the act of April 22, 1898, Congress made certain provisions in regard to the export of coal or other material used in war from the seaports of this country. The list of absolutely contraband articles included ordnance machine guns, armor plate, and everything that pertained to the offensive and defensive armament of naval vessels, and instruments especially adapted for use in war by land or sea; torpedoes, cases for mines, engineering and transport materials, ordnance stores, portable range-finders, signal flags, ammunition and explosives, etc. Coal was conditionally contraband, that is provided it was designed for a naval station, a port of call or ships of the enemy. Other articles placed upon the list of conditional contraband goods were materials for railways or telegraphs and money when such materials or money were designed for an enemy's ship or for a place that is besieged. The object in making coal contraband only under certain conditions was to prevent losses to American exporters, and this object appears to have been realized, for, according to a report of the Commissioner of Navigation, the coal exports for May and June showed an increase of 7 per cent. over those for the same months of 1897; and yet it was stated that no coal, so far as known, reached the hands of the enemy during hostilities. The restrictions on the export of coal were removed soon after the destruction of Cervera's fleet. This policy of the United States in the matter of privateering, the seizure of neutral goods, the effective blockade, and contraband material, and the action of Spain in declaring its adherence to the Declaration of Paris, marked an advance in the history of international law. Two out of the three States which had refused to sign the Declaration of Paris in 1856 had now virtually acceded to that declaration.

War Legislation.—For convenience in reference, the following summary of the chief war measures of Congress is given:

Feb. 23. The appropriation of \$200,000 for the work of recovering the bodies of the victims of the *Maine* disaster and the saving such parts of the vessels as had value.

March 3. An appropriation for the relief of the relatives of those who had perished on the *Maine*.

March 9. The passage of the act appropriating \$50,000,000 for national defence.

April 19. The passage of the joint resolutions demanding the evacuation of Cuba by Spain and empowering the President to use the army, navy and militia for the enforcement of the resolutions.

April 21. An act authorizing the President to prohibit the exportation of coal or other war material.

April 22. An act establishing the organization of a volunteer army.

April 23. The introduction of the War Revenue bill in the House by Hon. Nelson Dingley, providing for increased taxes on beer, tobacco and tonnage, and for various small taxes (see preceding paragraph on War Revenue Act), and for the issue of 3 per cent. bonds up to \$500,000,000, and for \$1,000,000 U. S. interest-bearing treasury notes.

April 25. An act declaring that war had existed with Spain since April 21.

April 26. An act for the reorganization of the regular army in such a way as to admit of the introduction of the three-battalion system and an increase of its strength from 27,000 to 61,000 men.

April 29. Passage of the War Revenue bill in the House.

May 2. The passage of the emergency appropriation of \$35,000,000 for the War Department.

May 4. The Naval appropriation act for the fiscal year ending June 30, 1898, providing for the building of three new battleships, four harbor defence monitors, 12 torpedo boats, and 16 torpedo boat destroyers.

May 7. Appropriations for fortifications and other armament, being a large increase over the amount usually appropriated.

May 10. The approval by the President of the resolution of Congress tendering the thanks of the nation to Admiral Dewey for his distinguished conduct in the conflict with the enemy at Manila.

May 11. An act providing for the establishment of a volunteer brigade of engineers

not exceeding 3,500 men, and of 10,000 volunteer immunes, *i. e.*, possessing immunity from diseases of a tropical climate.

May 12. An act increasing the number of surgeons in the army.

May 18. An act authorizing the furnishing of supplies to the destitute in Cuba, and of arms, equipments, and military stores to the insurgents; also an act organizing a volunteer signal corps; also an act adding two officers to the adjutants' department of the army.

May 26. An act for the organization of a volunteer navy of 3,000 men to serve for one year or less, and to be disbanded at the close of the war.

June 2. An act for increasing the number of army hospital stewards.

June 7. An act authorizing the Secretary of War to purchase at his discretion war material abroad and the Ordnance Department to buy stores and make contracts without advertisement.

June 8. The appropriation for deficiencies in the War and Navy Departments.

June 17. An act for the organization of the Navy Hospital service.

July 5. An act to increase the engineering corps of the regular army.

July 7. An act of appropriation to supply deficiencies for the Departments of War, Navy and Agriculture. This brought the total of appropriations to supply deficiencies up to the sum of \$360,000,000, the greater part of which was necessitated by the war. On this same date acts were also passed to promote the efficiency of the Quartermaster's Department and of the Subsistence Department; to increase the force of the Ordnance Department, and to increase temporarily the force of the Inspector General's Department.

War Administration.—Some of the steps taken to increase the strength of the army and navy have been given in preceding paragraphs and in the summary of the war legislation. Early in March preparations for navy hostilities were begun, and these preparations went on with especial activity after the \$50,000,000 appropriation became available. They included the purchase of two new Brazilian war vessels, and of auxiliary vessels, from the merchant marine. At the same time the shipping in all the United States ports was systematically inspected with a view to ascertaining what ships were suitable for conversion into cruisers, torpedo boats and despatch boats. For the latter class, fast yachts and sea-going tugs were purchased and made up what was called the "mosquito fleet" which was employed as a coast patrol. Soon an auxiliary fleet of considerable strength was created, and by the time that war broke out the vessels of the regular navy had been concentrated chiefly in the three squadrons stationed respectively at Hampton Roads, Key West, and Hong-kong. One of the first acts of naval administration was the President's proclamation on April 22 of a blockade of the north coast of Cuba between Bahia Honda and Cardenas, and of the port of Cienfuegos on the southern coast. The Key West squadron under acting Rear-Admiral Sampson was despatched to Cuba to maintain the blockade.

In the meantime other military and naval operations had gone on rapidly. At first the work consisted mainly of strengthening fortifications and mining the different harbors. On March 11, a new military department was created, known as the Military Department of the South. It included the five Southern States of South Carolina, Georgia, Florida, Alabama, Louisiana, and Texas, and was formed by uniting the hitherto separate department of Texas with a portion of the Department of the East. Gen. Wm. Montrose Graham was placed in command, with headquarters at Atlanta. On April 16 the mobilization of the regular troops began and they were concentrated at the following posts: Chickamauga, Ga., New Orleans, La., Tampa, Fla., and Mobile, Ala. The bill establishing the volunteer army was passed on April 22, and the President issued his call for 125,000 two-year volunteers on the 23d. The bill provided that the volunteers should be taken from the several States and Territories so far as possible in proportion to their population; that they were to be subject to the same regulations as the regular army; that they were to be organized into divisions of three brigades each, with three or more regiments in each brigade, and that three divisions should constitute an army corps. As to appointments, it was provided that the President by and with the consent of the Senate might appoint the staff officers for the corps, divisions and brigades or assign to such positions officers of the regular and volunteer army; and that the Governors of the States might assign regular officers to field duty with the volunteers with the consent of the President. As to pay, allowances and pensions, volunteer officers and men were to be on the same footing as the regulars. The appointing power of the President under this act was exercised in the choice of the eleven major-generals of volunteers of whom seven were brigadiers in the regular army and four were from civil life. In May the volunteers gathered in their respective cities and before the close of the month nearly all of the 125,000 men called for on April 23 had been mustered in. Then came the President's second call on May 25, for the additional 75,000. A good many candidates for enlistment in the State volunteers were rejected, the medical examination being very severe, and a still larger number of candidates for the regular army were found unfit.

In the exercise of the appointing power the President and Secretary of War gave preference in the case of army commands to officers of the regulars, and to graduates of West Point in civil life, but the minor commissions were bestowed in many instances upon civilians giving rise to much adverse criticism on the ground that undue political influence had been brought to bear upon the authorities. At a very early date the criticism of the War Department on this and other grounds began to fill the columns of the press, and as the war advanced it gathered force and continued until the close of the year. The condition of affairs at Tampa, Florida, provoked a hostile criticism from the first. The alleged incompetence of the staff officers there became the ground of a sharp attack upon the War Department, the appointments being attributed to jobbery or gross incompetence, and in some quarters it was even then alleged that the Secretary of War should be requested to resign. On the other hand, it was said that while conditions were not all that could be desired in the case of the volunteers, this was due to the haste with which they had been equipped and mobilized, and to causes for which the department authorities were in no wise responsible. But the regular army was said by defenders of the administration to be in an admirable condition, well supplied and enjoying the best of health. Early in June, the Secretary of War published the statistics of the work done by various boards of the department explaining the difficulties which had been surmounted. This was intended to justify the department in the face of hostile criticism which seemed to some not sufficiently to take into account the arduous nature of the work.

The mustering in of the negro volunteers was accompanied by some difficulty on account of the desire of the latter in some cases for officers of their own race—a desire which the authorities found it hard to gratify on account of the difficulty of finding negroes who were competent to serve as officers. In some regiments commissions in the colored regiments were given to colored sergeants in the regular army. The Eighth Illinois, a colored regiment, went into the war having its own colored officers. On June 22, a new army corps was created under the name of the Eighth Army Corps and the organization was entrusted to Gen. Wesley Merritt in San Francisco. Mr. Theodore Roosevelt, Assistant Secretary of the Navy, resigned in the beginning of May in order to serve as Lieutenant-Colonel of the First U. S. Volunteers known as the "Rough Riders," and Charles H. Allen was appointed as his successor.

Military Camps.—According to the Quartermaster-General's report, camps were established during the war at the following points: Tampa, Fla.; Mobile, Ala.; Camp Thomas (Chickamauga), Ga.; Camp Alger, Va.; Camp Poland, Knoxville, Tenn.; Jacksonville, Fla.; Miami, Fla.; Fernandina, Fla.; Camp Wikoff, Montauk Point, N. Y.; Camp Hamilton, near Lexington, Ky.; Camp Meade, Pa.; Camp Wheeler, Huntsville, Ala.; Camp Shipp, Anniston, Ala. The criticism of the war administration will be more fully noticed in a succeeding paragraph, but the following statements of the Surgeon-General may be of interest here as presenting the official answer to the charge that the camp sites were not properly selected:

"The sites of certain of the camps have been instanced in the newspapers as the cause of the sickness which was developed in them; but a review of the whole situation shows that it was not the site, but the manner of its occupation which must be held responsible for the general spread of disease among the troops. On April 25, 1898, foreseeing the likelihood of insanitary conditions in the camps of our newly raised troops, and with the view of preventing them, I issued Circular No. 1 from this office, impressing upon medical officers their responsibility in sanitary matters, and the necessity for a strict sanitary police, particularly in the care of the sinks and in the preservation of the camp area from contamination. But the density of the military population on the area of these contracted camps prevented the possibility of a good sanitary condition. Camps of this character may be occupied for a week or two at a time without serious results, as in the case of national guardsmen out for ten days' field practice during the summer, but their continued occupation will inevitably result in the breaking down of the command by diarrhea, dysentery, and typhoid fever."

Peace Negotiations.—On July 26, the first overtures of peace were made by Spain through the French Ambassador M. Jules Cambon and on August 12, the United States Secretary of State and the French Ambassador, as the representative of Spain, signed the protocol, the text of which though given in the article Spanish-American War, is repeated here for convenience.

1. That Spain will relinquish all claim of sovereignty over and title to Cuba.
2. That Porto Rico and other Spanish islands in the West Indies, and an island in the Ladrones, to be selected by the United States, shall be ceded to the latter.
3. That the United States will occupy and hold the city, bay, and harbor of Manila, pending the conclusion of a treaty of peace which shall determine the control, disposition and government of the Philippines.
4. That Cuba, Porto Rico, and other Spanish islands in the West Indies shall be immediately evacuated, and that commissioners, to be appointed within ten days,

shall, within thirty days from the signing of the protocol, meet at Havana and San Juan, respectively, to arrange and execute the details of the evacuation.

5. That the United States and Spain will each appoint not more than five commissioners to negotiate and conclude a treaty of peace. The commissioners are to meet at Paris not later than the first of October.

6. On the signing of the protocol, hostilities will be suspended, and notice to that effect will be given as soon as possible by each government to the commanders of its military and naval forces.

The commissioners on the part of the United States were Secretary of State Day, Senators Frye, Davis and Gray, and Mr. Whitelaw Reid. The secretary of the commission was Prof. J. B. Moore, Assistant Secretary of State. The Spanish commissioners were Señor Montero Rios (President of the Senate), Senator Abarzuza (formerly Ambassador to France), Gen. Cerero, Señor Villarutia (Spanish Minister to Belgium), and Señor Garnica (Councillor of the Court of Cassation). The commissioners required by the terms of the treaty for Cuba and Porto Rico were as follows: For Cuba on the part of the United States, Major-General Wade, Rear-Admiral Sampson, and Major-General Butler; on the part of Spain, Major-General Parado, Rear-Admiral Montoro; for Porto Rico, on the part of the United States, Major-General Brooke, Rear-Admiral Schley, and Brigadier-General W. W. Gordon; and on the part of Spain, Gen. Ortega, Commodore Vallarivo, and Judge-Advocate Sanchez del Aguila. The Peace Commission met in Paris at the *Salon des Ambassadeurs*, in the Foreign Office on October 1, and remained in session, occasionally behind closed doors, until December 10, when the treaty was signed. The two chief topics of discussion were the responsibility for the Cuban debt, and the retention of Spanish sovereignty over the Philippines. The consideration of the status of Cuba lasted about a month. The amount of the Cuban debt in 1897 was about \$350,000,000 and at the time when the commission was in session it was estimated at about \$500,000,000. The usual rule of international law requires a nation annexing territory as a result of conflicts to assume the responsibility for the debt, but, in the case of a nation struggling for independence, it has been held that in the event of success the burden of the debt rests upon the government and not upon the people. The Americans held that the proceeds of the debt had not been spent for the benefit of Cuba, but for the benefit of Spain, and that the responsibility for it could not be assumed by the United States. The Spanish Commissioners wished to transfer the sovereignty over Cuba to the United States, and this would have imposed the obligation for the debt upon the United States. But the American Commissioners could not accept this as it was violative of the declared purpose of the United States to leave the control of Cuba to its people after having once pacified the island and the declaration in the war resolutions that Cuba was and ought to be free and independent. An agreement on this point was reached on October 27, when the Spanish Commissioners agreed to include in the Treaty of Peace the substance of the Cuban article in the protocol.

The dispute over the Philippines was far more serious. The difficulty arose from the circumstances attending the acceptance of the protocol by Spain. The protocol as originally framed contained the word "possession" in place of the words "control, disposition and government" in the third article, but the latter were substituted in order to soften the passage and not to give unnecessary offence to Spain. This portion of the protocol requiring that the control, disposition and government of the Philippines should be determined by the treaty, was opposed by the Spanish government from the first. Upon receipt of the protocol Señor Sagasta stated that the terms relating to the Philippines seemed wholly indefinite to the Spanish government. He said that while there was a blockade maintained on the sea by the American fleet, and a siege established on land, the whole archipelago was still in the power and under the sovereignty of Spain. He announced that the Spanish government would not accept the third clause of the protocol. While offering the temporary occupation of Manila as a guarantee, the Spanish government would not renounce the sovereignty of Spain over the archipelago. He concluded by saying that "the government of her Majesty accepts the third condition with the above named declarations." The United States authorities, realizing that if they attempted to argue out this point, it would prolong the correspondence indefinitely, decided to construe the Spanish reply as an acceptance of the entire protocol. A protocol containing the same terms was sent to Spain the next morning, together with a note stating what had been said to Ambassador Cambon when he presented the Spanish reply. The Spanish government authorized the signing of the protocol under the ultimatum of the United States government that it must be accepted or rejected at once.

Now the members of the Commission held that in signing the protocol Spain had reserved her sovereignty over the island and that the words "control, disposition and government" merely gave the Commissioners the right to impose certain conditions upon Spain's manner of disposing of or governing the islands. The Americans re-

jected this view and refused even to submit the meaning of the words to arbitration. The Spanish Commissioners also contended that the American Secretary of State had orally consented to the Spanish interpretation of the protocol in the course of the conversation with M. Cambon. On October 31, the American Commissioners formally stated the demands of the United States. These included the cession of the whole archipelago, and the United States was not to assume the debt, but agreed to reimburse Spain for her outlay on improvements in the islands. These demands were refused by the Spanish government on November 4, on the plea of reserved sovereignty. It also held that the capture of Manila was invalid since it had taken place after the protocol was signed. Complaint was made that the United States had violated international law by this capture, and by the seizure of customs due to Spain to the value of about \$1,000,000. It was said, moreover, that the action of the United States had prevented the Spaniards from putting down the revolt in the Philippines. The United States Commissioners denied these statements, saying in regard to the reserved sovereignty that the United States government had not intended for a moment to admit the Spanish claim at the time when the protocol was signed. It had merely meant to leave the matter to be determined by the Commission. At last the United States Commissioners refused to discuss the matter further. A period of suspense followed and on November 21, the Americans made their final offer. They said that the United States must have the Philippines but would pay the sum of \$20,000,000 for them, and would guarantee freedom of trade to Spain for ten years on the same footing as the United States, and in general the maintenance of the policy of the "open door." It was also proposed that there should be a mutual abandonment of claims for damages on the part of the United States and Spain from the beginning of the Cuban revolt to the time when peace was signed. A reply was requested by November 28. In the interval Spain offered to give up the Philippines with the Ladrões thrown in for the sum of \$100,000,000, or all the Philippines except Mindanao for \$50,000,000; or all the Philippines without compensation if the United States would consent to an arbitration of the question of responsibility for the debts of Cuba and the Philippines. These offers were all refused by the United States Commissioners, who said, however, that their government might be willing to purchase the Carolines and the Pelews. After a vain appeal to the powers Spain gave way on November 28, but did so under protest, saying that the course of the United States was illegal. The United States Commissioners now asked for the cession of one of the Carolines and for a cable and coaling station at Ceuta, and also for the establishment of religious freedom in the Carolines. These requests were refused. On December 10, 1898, the treaty was signed.

In many quarters on the Continent the action of the Americans was viewed unfavorably as showing a lack of moderation in dealing with a conquered foe. This was especially true of France, where although neutrality was observed, the press seemed to think that the equity of the matter was on the side of Spain. The Spanish interpretation of the third clause of the protocol was there accepted. A French political writer of moderate views says on this point that the purport of this article was that Spanish domination in the Philippines should be maintained and that the American occupation should end as soon as the question of the government of the islands was settled. From the American point of view this interpretation was far-fetched and absurd. In France it was also commonly stated that it was the plain duty of the United States to assume the debts of the Philippines and Cuba, and that its course in this matter was contrary to precedent. It was urged that the European governments should observe carefully the diplomatic methods which this new participant in international politics was about to introduce.

Cost of the War.—The finances of the war appear to have been managed with great ability. Congress was prompt in voting appropriations and the moneys were judiciously expended. The prompt response of Congress to the call for the \$50,000,000 loan has already been mentioned. The vote was practically unanimous. The bureaus of the War and Navy Departments to which this appropriation was allotted expended it upon the purchase of the two Brazilian cruisers, and a large number of auxiliary vessels, and upon strengthening the harbor defence and placing the army and navy upon a war footing. Other appropriations were included by Congress in the deficiency bills according to requests submitted by the War and Navy Departments from time to time. The following schedule showing the appropriations made during the second session of the Fifty-fifth Congress to meet expenses incident to the war with Spain is quoted from an article by Mr. Charles A. Conant:

For the national defence act, March 9, 1898.....	\$50,117,000.00
Army and navy deficiencies act, May 4, 1898.....	34,625,725.71
Naval appropriation act, May 4, 1898—amount of increase over preceding naval appropriation act.....	23,095,549.49
Fortification appropriation act, May 7, 1898—amount of increase over act as passed by House.....	5,232,582.00

Naval auxiliary act, May 26, 1898.....	\$3,000,000.00
Additional clerical force, War Department, Auditors' offices, etc., act June 8, 1898.....	18,015,000.00
Appropriations in act to provide ways and means to meet war expenditures, June 13, 1898.....	600,000.00
Army, navy, and other war expenses for six months, beginning July 1, 1898, in general deficiency act.....	226,604,261.40
Expenses of bringing home remains of soldiers.....	200,000.00
Total	\$361,788,095.11

Early in May the Secretary of War and the Secretary of the Navy appeared before the Senate Committee on Finance and submitted estimates of the amounts needed by their respective departments for the conduct of the war. These estimates were not questioned by Congress, which promptly voted the entire amount. It is important to notice that the Treasury was thoroughly prepared when war came. The means for meeting the appropriations were on hand and the balance in the Treasury was sufficient to enable legislators to discuss at some length measures for raising revenue. The revenue bill, passed on June 14, after considerable discussion, proved the soundness of the Secretary's and Treasurer's estimate since as a result of it the Treasury was adequately supplied with funds to meet the expenses of the war.

As to these expenses, it is difficult to make satisfactory estimates. The expenditure of \$361,000,000 was authorized by Congress, but the amount actually spent during the following month does not reveal the entire cost of the war. It was computed by the Assistant Secretary of the Treasury Department that the expenditures during the months of April, May and June, amounted to \$56,000,000; in July to \$34,000,000, and from August 1 to August 18 to about \$14,000,000. The method for determining these amounts was to deduct the warrants drawn by the Treasury Department for the army and navy expenditures in these months from the warrants drawn during the same months in 1897. The excess would thus seem to represent the expenditures attributable to the war. The aggregate was \$102,462,116, which would therefore roughly represent the expense of the war from March 1 to August 18. These are not satisfactory figures because much work undertaken on account of the war was not completed and had not been paid for at that time. Again, there was the matter of back pay, and the expenditures did not by any means represent the amount due to the troops. The expenditure of the navy seemed to be especially well conducted. The portion of the \$50,000,000 appropriation which was allotted to the Navy Department was to be expended chiefly upon the purchase of new vessels which alone cost the Department about \$25,000,000. Down to August 15 the portion of the emergency appropriation allotted to the War Department amounted to \$19,811,648, of which about \$10,500,000 was left unexpended on August 15. Down to the end of October, 1898, it was estimated that war expenditures amounted to \$165,000,000, of which \$125,000,000 was for the army and \$40,000,000 for the navy. The following table taken from the report of the Secretary of War for the year 1898, shows the extraordinary war expenditures prior to July 1, 1898, the extraordinary war appropriations available until Jan. 1, 1899, and the estimates of extraordinary appropriations required for the six months ending June 30, 1899:

GENERAL OBJECT.	Expenditures from extraordi- nary war ap- propriations prior to July 1, 1898.	Extraordinary war appropria- tions made available until Jan. 1, 1899.	Estimates of extraordinary appropriations required for the six months end- ing June 30, 1899.
Salaries and contingent expenses.....	\$25,000 00	\$312,000 00	\$320,000 00
Pay, etc., of the Army.....	6,225,000 00	50,880,199 39	18,823,475 84
Subsistence of the Army	4,848,164 56	23,106,755 78	11,876,025 00
Regular supplies Quartermaster's Dep't.....	600,743 49	13,500,000 00	5,646,200 00
Incidental expenses, Quartermaster's Dep't....	81,915 88	6,000,000 00	1,350,000 00
Barracks and quarters.....	80,500 00	2,750,000 00	.....
Contingent expenses of the Army	120,000 00	422,000 00	200,000 00
Cavalry and artillery horses.....	1,157,499 14	5,500,000 00	292,500 00
Army transportation	4,932,431 49	59,000,000 00	12,294,225 00
Clothing, etc.....	4,208,513 87	36,000,000 00	6,401,614 00
Medical department	100,000 00	604,000 00	2,800,000 00
Ordnance department.....	112,642 24	14,281,225 00	673,500 00
Fortifications and sea-coast defenses.....	79,500 00	8,714,898 00	.....
Miscellaneous items	542,834 00	1,277,034 00	.....
Total.....	\$22,564,744 12	\$221,828,112 17	\$60,177,539 84

*\$2,250,000 of the appropriation for barracks and quarters was made available by Congress until June 30, 1899.

Diplomacy During the War.—Every effort was made after the outbreak of hostilities with Spain to maintain friendly relations with all the European powers. President McKinley was blamed by some persons for returning a reply to the joint note which the representatives of the powers addressed to him on April 7 in regard to the wishes of their respective governments that further negotiations would lead to an agreement which would insure peace. It was said that the President had departed from the traditional policy of the United States in paying any attention to such representations, but it is probable that the President desired an assurance from the representatives of the powers that they would co-operate with him in the attempt to maintain peace. Instances of the conciliatory policy adopted by the State Department toward foreign nations after the war began were the conclusion of a reciprocity treaty with France and the permission accorded to the French steamer *Lafayette* to pass the blockade into Havana and land passengers. Germany was the only foreign power which seemed inclined to disregard the obligations of neutrality, and the course of Admiral Diedrichs and Prince Henry appeared to indicate the existence of secret official instructions to hamper the Americans in the Philippines. These tactics were met by the successful diplomacy of Admiral Dewey, but the United States showed no unfriendly spirit throughout this affair. The State Department was criticised by some diplomats for what they termed its "shirt-sleeve" policy in the negotiations with Spain. So far as those negotiations have been made known, the charge that the United States government showed the discourtesy and roughness which this term implies is not sustained. The Secretary tried to prevent war by urging Spain to make concessions. When it was evident that Spain was helpless, he pursued a decisive and urgent policy which brought the war to a close. In so doing he was acting for the benefit of Spain, for by prolonging the war she would only have added to her losses and would not have obtained better terms. During the war the Secretary of State applied himself to enlisting the influence of foreign powers to induce Spain to make overtures of peace. In some quarters it was believed that the war would last a year, even after the American success at Manila and Santiago; for, it was argued, Spain could not lose much more than she had already lost, while the continuation of the struggle would seriously annoy the United States. It was, therefore, a matter of surprise that Spain offered terms of peace so early as she did. The overtures for peace were first made on July 26 through the French ambassador at Washington, M. Cambon.

Criticism of the War Department.—The administration of the Navy Department was acknowledged on all sides to have been remarkably efficient during the war, but the War Department officials came in for some severe criticism. It arose chiefly from the suffering and mortality of the troops. The large number of soldiers that died from disease compared with the number of those who were killed in battle or died from wounds, namely, 2,565, as contrasted with 345, gave color to these accusations, although the greater number of deaths from disease resulted from exposure to typhoid and malaria fevers in Cuba. What especially aroused public indignation was the high mortality that prevailed in the camps in the United States, where it was attributed largely to the negligence of those in authority. It was urged that insufficient care was taken in the selection of camp sites, and that the positions of camps were not shifted in spite of the dangerous conditions that had developed. Typhoid fever and other filth diseases ravaged the rank and file to an extent that seemed wholly unnecessary, had proper precautions been taken. While this condition was in large part attributable to the ignorance and lack of experience on the part of the volunteers, it was thought by many that the authorities could have prevented much of the evil. Another ground of attack was the alleged inefficiency of the supply departments, namely, those having charge of quartermaster's supplies, subsistence and medical supplies. It was pointed out, for instance, that the tentage was insufficient for many weeks after the troops had reached Cuba; that the food was both insufficient and bad in quality; that medical supplies were not received in time, and, in fact, that the supply system seemed to have broken down all along the line. In the press this was attributed to the appointment of inefficient officers to staff duties as a result of political jobbery. The right and wrong of the matter could not be determined even as late as the close of the year. The complaints influenced the Administration to appoint an investigating commission. At the request of the Secretary of War the President ordered an investigation of the War Department, especially of the Commissary and Quartermaster's and Surgeon-General's departments. The following persons were appointed as members of this commission: Ex-Governor James A. Beaver, of Pennsylvania; Charles Denby, of Indiana (formerly Minister to China); Major-General G. M. Dodge, of Ohio; Captain E. P. Howell, of Georgia; Major-General A. McD. McCook (retired); Major-General A. J. Sexton, of Illinois; Major-General J. M. Wilson (Chief of Engineers); ex-Governor U. A. Woodbury, of Vermont, and Dr. Phineas Conner, of Ohio. The Commission held its first session at Washington.

D. C., meeting there on September 24. After a few days, during which the Commission effected its organization and chose General Dodge as chairman, it set out to visit the principal camps.

From the press reports it appeared that the Commission was inclined to elicit only favorable testimony and to undervalue severe criticism. It did not report until after the close of the year, and the comments in the newspapers were somewhat premature. The testimony was conflicting, but some of it was of great importance. Naturally, the unfavorable criticism attracted the most attention. Many witnesses who had taken a prominent part in the war appeared before the Commission. The testimony of Colonel Roosevelt attracted much notice. He said that a great deal of avoidable confusion prevailed at Tampa, and that the regimental officers had to take matters into their own hands in the choice of camp sites and in the provisioning of troops. The time of the departure for Cuba was also a period of confusion. As to the condition of affairs in Cuba, he noted that the canned beef issued was of bad quality and nauseated the men; that there was a lack of transportation; that the clothing was unsuitable, being too heavy for a tropical climate; that the medical supplies were insufficient; and among other defects he mentions the lack of smokeless powder, the insufficient medical attendance, the absence of means of boiling water, etc. Too much was left to the individual initiative of the regiment officers, who had constantly to obtain by their own efforts and under great difficulties things which the Government should have supplied. The testimony of General Miles before the Commission occasioned more comment and had more important results than that of any other witness. He, too, spoke of the insufficiency of medical supplies, and quoted General Shafter as saying that no one had all the supplies that were needed, and that soldiers died from lack of medicines. As to supplies for the army in Porto Rico, he said that while they were sufficient they were not properly loaded or classified, and the result was a serious delay in reaching the troops. He, too, complained of the quality of the beef, which he said was wholly unfit to be sent to a hot country. He called the refrigerated beef, of which about two hundred thousand pounds were sent, "embalmed beef"; and he said that it had been sent to his army under pretense of an experiment. He added that had paymasters been sent down there the army could have purchased good, fresh beef. When asked if reports to this effect had been made to the proper officers, he said that they had repeatedly been sent in, but that no attention had been paid them. This portion of the testimony, as reflecting upon the Commissary-General, greatly angered that officer. The witness also complained of the inadequate hospital accommodations; of the insufficiency of quartermaster's and commissary's stores, and of the bad management of transportation. The testimony of Adjutant-General Corbin was favorable to the conduct of the war, which, he said, if it were all to be done over again, could not be done better. The statements made by some persons that assignments had been made through favoritism he indignantly denied, saying that the appointees from civil life had without exception shown themselves good officers. In the course of his remarks he incidentally admitted that no active preparations had been made by the War Department until Congress declared war. General Merritt, in his testimony before the Commission, had no complaint to make in regard to the supplies, which, he said, were satisfactory at all times, except as to ice and milk for fever patients. Nor did he find any fault with the medical supplies and hospital conveniences. He also stated that he had the hearty support of his superior officers in all that he did. Several hundred witnesses were examined and a great deal of information was elicited as the result of a public invitation issued by the Commission on September 27 to all persons who knew of any wrong or dereliction on the part of the officers to submit statements on the subject to the Commission. The testimony taken covered a great variety of topics, including facts relative to the mobilization and organization of the troops; the camp and organizing equipage at the beginning of the war; the armament and equipment of the volunteers; the quantity, quality and kind of food supplied; the quantity and quality of tentage, beds, linen and all other necessities for the hospitals; the efficiency of the medical staff, and the conditions and operations of the ordnance departments. Among the witnesses summoned before the Commission, in addition to those already named, were the Secretary of War, the members of departments and officers of corps, divisions, brigades, regiments and companies, non-commissioned officers and privates. The Commission visited all the principal camp sites, where they inspected not only the camps, but the troops and the supplies. Among the defects of administration which were brought to their notice was a lack of foresight shown by the members of the departments in the War Department, resulting from the division of authority and responsibility; the inability of the Quartermaster's Department to discharge the heavy duties that devolved upon it; the lack of transportation facilities at the front, and, especially, the lack of lighters to enable the men to land at Daiquiri; the mis-carriage of the medical supplies, resulting in serious delay in their delivery at San-

tiago; and, finally, the insufficiency or bad quality of the rations, to which reference has already been made. As to the lack of preparation on the part of members of departments, it should be noted that the National Defense Fund provided by the act of March 9, 1898, was not made available, except for the navy and for coast defense, until after war was declared.

The Colonial Question.—To what extent the United States should depart from the policy of the past and become the possessor of colonies across seas, presented a question which led to much earnest discussion. Those who favored the colonial policy were termed "expansionists," and by some "imperialists." A great variety of arguments was employed on both sides, but they may be roughly classified as (1) those resting on constitutional grounds, and (2) those based on general principles of self-interest, morality, or political science. It will be impossible here to give more than a brief summary of the main arguments for and against the new colonial policy.

Constitutional Questions Involved in the Colonial Problem.—One of the objections urged against the permanent incorporation of the Philippines into the United States was the fact that the name of this nation is "The United States of America." It was asked if the United States of America could ever include a State comprising islands off the coast of Asia and having no possible connection with the American continent. This objection, if valid, would apply only to the Philippines, since the West Indies and the Hawaiian islands do in a sense belong to the American continent. The decision of the Supreme Court in the Dred Scott case declared that no American territory could be held permanently as a dependent possession and, even if this decision were not sustained, it was stated that it would not follow that territory that was not American could be so held. Admitting that the United States could acquire the Philippines, by what constitutional authority, it was asked, could they dispose of them if they were not wanted? Another argument was based on the 14th Amendment to the Constitution. According to this, any child born in any of the new possessions after the treaty, would be a citizen of the United States. It was admitted that from the point of view of this amendment the condition of the Indian tribes on this continent was exceptional, for they were viewed as wards of the nation. Possibly the uncivilized inhabitants of the Philippines might be regarded as holding the same position, but as to the more civilized inhabitants not only of the Philippines, but of Porto Rico they should by law have the right of suffrage which the inhabitants of the United States possess. How could Congress and the courts deal with this serious question, it was asked. The Constitution was designed for a civilized and educated people. Securities to which the individual is entitled by it seem not to be adapted to the social conditions that prevail in the new island possessions. For instance, it was said that to bestow these guarantees upon the half-civilized Moros of the Philippines or the brigands of Porto Rico would make it impossible to maintain over them an efficient government. The framers of the Constitution had never contemplated a time when it would be extended over an archipelago in Asiatic waters. Another point much emphasized was the fact that the first article of the Constitution provides that all duties, imposts and excises shall be uniform throughout the United States. How can the policy of the "open door" be maintained if the protective system continued in the United States? The duties imposed on imported goods must, according to the Constitution, be of the same kind and levied at the same rate at all ports of entry in the United States. But even by those who opposed permanent annexation it was generally admitted that the acquisition of these new possessions and the subjection of them to a temporary government was constitutional, nor could a fixed limit of time be assigned for the duration of this temporary régime. Congress would have to decide how long these possessions should be held under military rule. It was only permanent annexation that presented grave constitutional difficulties.

The advocates of permanent annexation met these difficulties by the following arguments among others: It was pointed out that there were two senses of the term "United States." In one sense it meant the Union proper, that is, only the States which are united as distinguished from the Territories. In another sense it included the entire lands within the national boundaries. This larger sense is a later development. The Constitution uses the term in its narrower signification and implies that the sovereignty rests in the actual union of States. It speaks of making all needful rules and regulations respecting the territory belonging to the United States; it does not call this territory a part of the United States. As to the uniformity of indirect taxes, Chief Justice Marshall maintains that the rule applies to the Territories no less than to the States, but the reason which he gives for this view is that such uniformity is equally necessary in the case of the Territories. In other words his reason rests upon expediency, and it would seem that constitutionally Congress might exercise its discretion in enforcing this uniformity. It might apply it to some territories and not to others. As to the argument that citizenship must

result from annexation, it is said that there is certainly a chance for the interpretation of the term United States in its narrower sense. In the case of the *United States vs. Wong Kim Ark*, it was decided that a person born in the United States of Chinese parentage, the father not being a citizen, but domiciled and doing business in the United States, is a citizen. If the broader acceptation of the term United States were taken, the principle of this decision would apply to the children of Filipinos born after annexation. But it is not necessary that the term should be thus construed. At least the court would have a right to decide in which sense the term "United States" was employed. It is employed in the narrower sense in the body of the Constitution, and some good reason should be given for holding that it has a different meaning as employed in the 14th Amendment. The presumption is therefore that the term would not apply to the territories acquired by the United States, and even should it be held that the term was indifferently used in the Constitution and its amendments, the court could decide its meaning in any specific case on grounds of expediency. As to the suffrage guaranteed to citizens of the United States under the 15th Amendment, it is said that this does not preclude the restriction of the suffrage by property or educational qualifications in the Territories. The answer to the constitutional objections to annexation are thus summed up by Professor H. P. Judson, in the *Review of Reviews*: "The power to acquire territory is no longer questioned. The purposes of annexation are not limited by the Constitution, but are at the discretion of the political branch of the Government. It is not necessary, therefore, that annexed territory should be destined for statehood. It may be held permanently as a colony for purposes of national defense, or from economic considerations. It may be held in trust for the inhabitants with the expectation of ultimately turning it over to them should they so desire, and should they prove themselves capable of orderly government. Meanwhile the government of such territory is subject to the control of Congress. The inhabitants of annexed territory do not by virtue of annexation necessarily become citizens of the United States—it is not beyond question that any of them do so become. The 14th Amendment is not of necessity so to be construed as to make birth in annexed territory result in American citizenship. . . . The limitation of uniformity placed by the Constitution on the power to lay indirect taxes is confined to 'the United States,' which may well mean the *States*. Thus there would be no such limitation so far as Territories are concerned, and hence Congress would be quite free to maintain therein such system of duties and excises as circumstances may warrant, irrespective of the policy controlling the 'States.' The navigation laws are constitutionally limited also with reference only to the 'States.' Thus Congress may, if it seems expedient so to do, establish the 'open door' in over-sea territories without let or hindrance from the Constitution. Such personal rights as the Constitution guarantees within the whole jurisdiction of the national government—both in States and in Territories—are on the whole such as would not materially impede adequate control of Federal territory, and at the same time such as we would wish to extend to all people under the American flag."

Discussion of the Colonial Problem on General Grounds.—The division of opinion on the annexation question did not follow sectional or party lines or lines of religious belief. Both sides urged their views with sincerity, and the discussion generally was on the broad ground of the public welfare and national morality. It is possible here to give only a few of the arguments advanced on each side. The discussion naturally turned on the Philippine question, for the status of Porto Rico and Cuba did not present the same difficulties or seem likely to be settled in a manner repugnant to those who were opposed to an expanding colonial policy. As to the Philippines, one of the chief arguments advanced was that the inhabitants of the islands were men fighting against Spain for their freedom and independence, and that for the United States, which had avowedly undertaken the war on behalf of an oppressed people, to step in and impose upon the islands a rule quite as foreign and quite as distasteful to the inhabitants as that of Spain was grossly inconsistent. The United States had declared that the war had not been undertaken in a spirit of conquest, and in the case of Cuba had expressly stated that its object was to free the island from tyranny. Why had not the Filipinos as good a right to independence as the Cubans? It was known that they opposed the rule of the United States, and that they would fight for their independence. It would be hard to require the soldiers of the United States who had just fought on the side of the Cubans to shoot down the Filipinos for demanding the same rights which the Cubans had struggled for. Permanent annexation to the United States seemed to its opponents an instance of that shotgun policy of imperialism which had disgraced the colonizing nations in the past. It would, moreover, embark the United States on a career of aggrandizement which would carry it far beyond its original design, involve it in rivalry with European powers, add vastly to its expense and demoralize its people. A great increase in the army and navy would be the necessary condition of such a system. More

than thirty-three years had passed since the close of the Civil War, and we were still bearing its burdens in the shape of an enormous pension list. There is no limit to the permanent expenses which would be entailed by this new colonial policy, for, besides the cost of maintaining a large army and fleet and of administering the colonies, there would no doubt be frequent wars with foreign powers and with the natives of our island possessions. The United States had accepted the Czar's invitation to attend the Peace Conference, but at the very moment when the powers were about to discuss gradual or partial disarmament, this country was committing itself to an opposite policy. And such a policy would mean not merely the maintenance of a force sufficient to insure order in the colonies, but an increase of military and naval strength to keep pace with the rival powers. It would have to watch jealously the reports from abroad in regard to the military or naval programme of this or that power and adjust its own policy to theirs. The opponents of expansion made light of the argument that there was not room enough in this large country, that in extent and resources it does not suffice for its present population, that new markets were needed and that our industries were cramped for space. They held that markets could be won without seizing the lands of uncivilized peoples. They regarded the maxim that "trade follows the flag" as resting upon mere superstition or sentiment, and pointed to the fact that the official reports for the year 1898 showed an extraordinary increase not only in domestic industries, but in all export trade. The statistics of foreign trade did not, they said, bear out the idea that "trade follows the flag," and they pointed to an article published by Lord Farrar on this point in which he aimed to show by a study of statistics that the foreign trade was developing independently of political control or possession. As to the duties to the conquered islands it was said that the duties to our own people were paramount. They held that our moral duty ended when we gave the Spanish colonies their liberty and that the overthrow of Spanish rule did not place us under any moral obligation to do political missionary work in the islands. Nor ought we to decide in advance whether or not they are capable of independent government; at least they should be allowed a fair trial. Our own Civil War, our policy toward the Indians, our labor riots, and the frequent killings by lynch law should make us pause before we decide upon the qualifications of another people for self-government. They might not develop a very admirable form of government and still provide themselves with an administration that was suitable to their needs. It would be possible to secure them against foreign aggression by a guarantee of neutrality such as obtained in the cases of Belgium and Switzerland in Europe. It was held that our politics were too corrupt and that our consular system was too inefficient to warrant our undertaking the government of colonies. Every disorder in our internal affairs was advanced by the opponents of expansion as a proof that we were incapable of discharging these wider obligations. In general the opposition was directed to the ratification of the treaty, for it was thought that the plan of immediately taking possession of the whole archipelago would end in its permanent incorporation with the United States. Many efforts were made to commit the government to a distinct statement that it would not retain the Philippines permanently and many modifications of the policy in regard to them were proposed. Some wished the whole archipelago to remain under Spanish sovereignty. Others favored the establishment of a United States protectorate, while leaving the archipelago under the sovereignty of Spain. Others wished all the islands to be left to the inhabitants, and still others proposed a joint protectorate on the part of the United States and certain chosen powers. These were but a few of the proposed substitutes which ranged all the way from the undisturbed sovereignty of Spain to the complete independence of the islands and included various proposals for giving to the United States certain parts of the islands. Among the leading opponents of the whole policy of expansion was Senator Hoar, of Massachusetts, who made one of the ablest speeches in the United States Senate on this subject. Some who agreed with the general principles of the anti-expansionists held that the treaty should be ratified, and that the question of annexation should be decided afterward. Colonel W. J. Bryan, for instance, said that the rejection of the treaty would involve the settlement of the question by diplomacy and result in international complications. He proposed that after the treaty was ratified Congress should declare its purpose of establishing an independent government in Cuba, Porto Rico and the Philippine Islands.

On the other hand, the expansionists sought to outweigh these arguments by appeals to imagination and feeling, to economic self-interest, to the law of development which they found operative in our history and to the moral duty of imposing the higher upon the lower civilization. But apart from these general considerations it was urged that the President's plan of immediately taking possession of the Philippines was the most simple and direct method of dealing with the situation. It was generally admitted that to hold these islands merely for the commercial profit or political interests of the United States would be wrong, but the ratification of the

treaty would not indicate any such intention. Ratification, accordingly, was favored even by some who did not approve of the permanent retention of the islands. The plan of the Administration was supposed to involve a military protectorate at first, with the gradual extension of the rights of self-government to the inhabitants as they developed the capacity for such self-government. The President, in the course of his speech at Savannah, Ga., said that it was as clearly the duty of our fleet to remain at Manila and give the inhabitants protection as it had been to take the Spanish fleet and destroy the Spanish sovereignty in the archipelago. He declared that the inhabitants of the Philippines should be guided by the United States to the better government which will secure to them peace and education and security in their life and property and in the pursuit of happiness. It was generally supposed that the Administration's policy was to retain the Philippines for the time being. But those who went beyond the question of the status of the Philippines in the immediate future and upheld the principle of colonial expansion as desirable in itself had some strong arguments to urge in its favor. They referred to the unrest which for several years had prevailed throughout the United States and scouted the idea that the warlike spirit had been brought into existence merely by the Cuban war and the destruction of the *Maine*. They said that for a long time the country had been demanding new outlets for its enterprise and that, whether right or wrong, a war feeling had rapidly developed, expressing itself, for instance, in the Chilean affair in 1891, and many times since then in the disputes with Great Britain over the Behring Sea and Venezuelan questions. The desire for a more aggressive international policy and for the expansion of national influence had also shown itself in the recent demand for closer relations between this country and the South American republics. The Cuban war came at a time when this impulse was very strong and it offered an opportunity for a bold and positive course of action in foreign affairs which, at the same time, should seem to be justified on moral grounds. The idea of expansion had not originated in the war, but the war was its logical consequence, and in return it stimulated it. The expansionists spoke in a sanguine manner of the results which would follow from the war. In the first place, they said there would be no more of that narrow-minded and provincial tone which Americans had employed in speaking of foreign affairs. Americans could no longer say that they had no interest in foreign politics or in foreign trade. Foreign trade would not be sacrificed to domestic industries to the extent that had formerly been the case. Some predicted that the protective policy would not last. Trade expansion would be found incompatible with its maintenance, and just as in England the expansion of foreign trade followed on the heels of the repeal of the Corn Laws, the abandonment of the protectionist policy by the United States would be a necessary step in the development of foreign commerce. The war had drawn men's minds to the countries beyond seas and had opened up to them the possibilities of commercial enterprise in the Far East. There would be more attractive features in the Free Trader's arguments than before and they would be addressed to a different audience. The expansionists admitted that the only thing needful to trade was the maintenance of the "open door" policy. Nor did they hold that in itself the planting of the flag in a country was a condition precedent of trade with the inhabitants, but they pointed to the fact that nations were not agreed upon this policy of the "open door," and while it was one thing to demand equal opportunities for trade it was another thing to maintain them. Russia, for instance, it was said, would not throw the door open in her Chinese possessions merely because this nation declared it to be right and reasonable for her to do so. The self-interest of nations, like that of individuals, is often in conflict. The United States would have no influence upon the trade policy in the Far East unless she had some possessions there. In this case our protests might be regarded, but if we retained no foothold in the East there would be a temptation to disregard our rights as those of a remote power. It was said that the only way in which the United States could make her demand for equal trade opportunities effective was by maintaining a foothold in the East. Opinion on this question was greatly influenced by the publication of a monograph by Mr. Benjamin Kidd on the *Control of the Tropics*, in the course of which he sets forth certain important conclusions which he has drawn from his study of the statistics of foreign commerce. He finds that the value of the tropical trade in the case of Great Britain is steadily increasing. In 1896 the value of Great Britain's foreign trade was £738,000,000, of which £138,000,000 was set down to trade with the tropics. In 1895 the foreign trade of the United States was \$1,538,000,000, of which \$346,000,000 was trade with the tropics. This points, in his opinion, to the increasing development of tropical countries by the white races. In this process two methods have been employed. The first has been the exploitation of the regions for the benefit of the alien race. The second has been the government of these possessions in the interest both of the inhabitants and of the home country. The author thinks that the second method is the only one that in the long run will succeed. The tropical colonies will be gov-

erned from a distance, however, for he does not believe that white races can ever effectually colonize the tropical region. This government from a distance is one of the most difficult problems that the world has had to face. Nations have repeatedly failed in it. England is one of the few instances of success, and this has been won only by years of patient effort. If the work of developing the tropics is to continue, it is urged that the United States shall assume its share of the burden and follow in the path that England has marked out. But at this point enters the questions of our fitness for the task. Admitting that the economic advantages may be great in the long run, it is a question whether the price paid for them will not be too high. The expansionists admit that for many years to come our government of the new territories will be unsatisfactory and that scandals of maladministration and corruption will be frequent. Civil service reform will not control appointments in the consular service and many unworthy agents will abuse their administrative privileges. It is urged, nevertheless, that the sense of responsibility will after a while develop the necessary moral qualities. The expansionists point to the case of England, where in the time of Walpole political corruption was more firmly entrenched than we have ever known it to be in this country, and yet within the next hundred years, which was a period of continuous colonial expansion, the government had not only discharged its new duties with success, but had improved immeasurably in its internal administration. It was naturally asked why the United States could not do as well. It was said that it was a poor estimate of the American character that would deny to it the possibility of successfully assuming these wider responsibilities. If Great Britain could rule over 11,000,000 square miles of territory inhabited by over 381,000,000 people, it seemed absurd to question the ability of the United States to control 168,000 square miles of territory inhabited by 10,000,000 people. The views of the expansionist received much encouragement from the English, who were quick to see that the interests of the United States as a colonizing power would coincide with those of Great Britain. Both these nations were interested in gaining greater opportunities for trade and in the maintenance of the policy of the "open door," while an exclusive trade policy was in general the characteristic of the other colonial powers. From the British point of view it was especially desirable that the United States should have a stake in the Far East and an unquestionable commercial interest in supporting the British policy there. A great deal was said in the United States about the aggressive attitude and increasing strength of Russia, which appeared to be tending toward the absorption of a large part of China. It was hinted that the principles of Anglo-Saxon civilization were imperilled, and it was asked whether the English-speaking nations were to control the politics of the world or to go down before the combination of which Russia was the controlling force. Mr. Archibald R. Colhoun, the author of *China in Transformation*, says: "It requires no elaborate argument to demonstrate that the death-knell of the British leadership in the world would be nearly as disastrous to America as to Great Britain. To realize the position the United States would occupy, it is only necessary to state the commercial and industrial policy of Russia wherever any possibility of rivalry is in question. The power of the United States to extend her trade in Asia, and, in a large measure, to expand as a nation, depends much upon the Anglo-Saxon supremacy. Once in possession of Turkey and Persia, of India and China, and with the resources of Asia organized under her direction, Russia would be not only supreme on land, but would be also the commanding sea power. With the Pacific Ocean a Russian lake, and Europe dominated, America and South Africa, in addition to Australasia, would, as a natural consequence, fall under the ascendancy of the Slav."

These are only a few of the arguments advanced on each side of the question, but are perhaps sufficient to show the important character and the general trend of the discussion.

The Philippines.—The relations of the United States to the Philippines were complicated by the attitude of the Philippine insurgents. Around Manila the native troops showed themselves increasingly hostile toward the United States as it became evident that the latter power was hesitating to grant the islands their independence. At Iloilo, the capital of Panay, affairs were even more threatening. The insurgents took possession of the suburbs early in November, and at the close of the year an American naval expedition arrived there. On December 24 the Spanish General Rios surrendered to the insurgents, who, upon the arrival of the Americans, were holding the city. At the close of the year there was every reason to believe that the insurgents were bent upon forcible resistance. Their leader, Aguinaldo, who had been chosen as president of the revolutionary government, formed a cabinet on December 29, whose members pledged themselves to secure independence for the islands. Agoncillo, the emissary of Aguinaldo, had already issued an emphatic protest against the adoption of any policy by the United States that should curtail the independence of the Philippines. The protest was issued while the Commissioners

were in session at Paris. It insisted upon the complete juridical and political independence of the Philippine people and denied the right of either the United States or Spain to adopt any measures that were prejudicial to it. It declared that the United States was bound in honor to recognize the freedom of the islands, and referred to explicit declarations on the part of American agents recognizing the autonomous sovereignty of the people. It denied that the Spaniards could transfer to the Americans the right of possession, since they themselves did not have this right. It emphasized the declaration made by the United States that in entering upon the war it was not guided by any intention of aggrandizement and expansion of national territory. For an account of the events in the Philippines during the war see the article **SPANISH-AMERICAN WAR**; and for an account of the general conditions in the islands and of the events that occurred after the war see the article **PHILIPPINES**.

Porto Rico and Cuba.—Porto Rico was evacuated by the Spanish soldiers in October and the American flag was raised in San Juan. Major-General John R. Brooke, as military governor, took up his residence in the Captain-General's palace. (See the article **PUERTO RICO**.) In October, arrangements were made for the evacuation of Cuba, when it was decided that Spanish control should cease on December 1, but it was later agreed that the Spanish surrender should be postponed to Jan. 1, 1899. Major-General Brooke was made military governor of the island of Cuba as well as of Porto Rico, but military governors were appointed in each of the six provinces. For an account of conditions in Cuba after the war see the article **CUBA**.

Foreign Relations.—An account of the relations of the United States with Spain, the intervention in Cuba, and the war is given in the preceding paragraphs and in the article **SPANISH-AMERICAN WAR** (q. v.), and some of the events of especial importance in the international relations of this country during the year are discussed under their respective titles. Here is given, for the sake of convenience, a brief summary of the peaceful foreign relations of the United States with references to the titles under which a more complete account will be found. The settlement of the sealing question, which was actively discussed during the fall and winter of 1897, received a check in January, 1898, by Lord Salisbury's positive refusal to reopen the question. On November 6, 1897, an agreement to stop pelagic sealing had been reached at a conference of the United States, Japan and Russia, and later in the same month a meeting of scientific experts, representing Great Britain and the United States, came to the following conclusions: The herd had fallen to one-third or one-fifth of its former size between 1884 and 1897; pelagic sealing is more destructive than land sealing, since it results in the killing of the females; there is no immediate danger of the complete destruction of the herd; the profits which the industry yields are not large, and both land and pelagic sealing are carried on in accordance with the law. The government of the United States tried to secure an agreement to put a stop to pelagic sealing, but Lord Salisbury's refusal to reopen the discussion prevented this. See the article **BEHRING SEA DISPUTE**.

The question of Hawaiian annexation was also left over from the previous year. It was soon seen that the annexation treaty would not be ratified, and in March its advocates despaired of the two-thirds majority requisite for ratification. The attempt was now made to bring about annexation by means of a joint resolution, and the committee reported a joint resolution containing provisions identical with those of the treaty. The approaching crisis in the relations of the United States with Spain deferred action in this matter until June, when the joint resolution was passed by the House (June 15), the events of the war having hastened this action. It was passed by the Senate on July 6, and on the following day received the approval of the President and became a law. The United States formally took possession of the islands on August 12. Pursuant to the provisions of the annexation resolution the President appointed a commission to recommend legislation in regard to Hawaii, and this commission remained in session at Honolulu for several weeks following August 25. Its report was submitted by the President to Congress with his message of December 6, 1898. See **HAWAII**.

Reports gained credence in the United States that there was a movement among the European powers for combined action against this country and on behalf of Spain. These reports continued during the earlier stages of the war. The attitude of Great Britain was in marked contrast to this alleged policy of the other powers. The British government and people were distinctly friendly, and a cordiality of feeling between the United States and Great Britain developed rapidly. Mr. Chamberlain's speech, on May 13, favoring an "Anglo-American Alliance" and the formation in London of an Anglo-American League in July, with the object of securing the most cordial and constant co-operation between the two nations, were signs of the increasing friendliness of the United States and Great Britain. (See **ANGLO-AMERICAN ALLIANCE**.) Another and more important event, which is attributable in part to this growing friendliness, was the appointment of a British-American Com-

mission to settle all points at issue between Great Britain and her colonies on the one hand and the United States on the other. The Commission met at Quebec on August 23, and, with the exception of a recess from September 2 to September 20, remained in session until October 10, when it adjourned to meet in Washington, D. C., in November. (See article CANADA, paragraphs on History.) On June 14, the United States Congress appropriated the sum of \$473,151 in payment of damages sustained by Canadian sealers. The good will of the Canadian government toward the United States was shown in the du Bosc affair. Señor du Bosc had been the Spanish *chargé d'affaires* at Washington. He went to Canada, where it was suspected he was engaged in schemes to the detriment of the United States. When evidence to this effect was adduced the Canadian government compelled him to leave the country.

In accordance with the provisions of the Dingley tariff for reciprocity a treaty was concluded with France toward the end of May, 1898, and went into effect on June 1. The signing of the treaty at the very time when popular rumors attributed unfriendliness on the part of France toward the United States did something toward removing apprehensions. On July 19, reciprocity was proclaimed with Denmark. Commercial relations with Germany were not harmonious, that country having adopted a retaliatory tariff policy. Certain food products of the United States were excluded from Germany and Austria, and their example was followed by Switzerland. See the article TARIFF.

After Dewey's victory at Manila some trouble arose between the American and German officers at that port. A large German force had been concentrated there, ostensibly for the protection of German interests. Rumors of friction between the Germans and the officers of the American fleet were circulated by the press, and occasioned great excitement in America, where it was suspected that Germany had designs upon the Philippines; and a belief in the unfriendly motives of that power continued in spite of a semi-official statement that the relations between Germany and the United States were in every way amicable. See the article SPANISH-AMERICAN WAR; see also SAMOAN ISLANDS.

The Federal Judiciary.—Some of the important decisions of the Supreme Court of the United States may be outlined as follows: It was decided in February, in the case of *Holden vs. Hardy*, that the eight-hour law in Utah forbidding the employment of laborers in mining, smelting and refining for more than eight hours a day was constitutional, falling within the police power of the State and not conflicting with the 14th Amendment of the Federal Constitution. In the *Nebraska Maximum Freight Rate* case it was held by a decision rendered on March 1 that the jurisdiction of the court extended over cases involving the question whether the railway rates established by State law were so low as to deprive the common carrier of property without compensation, and it was held that the Nebraska State law in question having fixed a rate which would have compelled the carrier to conduct business at a loss was contrary to the 14th Amendment of the Constitution and invalid. In the case of the *United States vs. Wong Kim Ark*, decided on March 28, it was held that a child born in the United States of Chinese parents domiciled in this country is a citizen of the United States from birth. On April 25 the progressive inheritance tax law of Illinois was upheld by the Supreme Court, which decided that it was not in conflict with the provisions of the Federal Constitution, and on the same day the clause of the Mississippi Constitution changing certain qualifications for voting and serving on juries was upheld on the ground that there was no express discrimination against colored men. Important decisions affecting the operation of the Interstate Commerce law were (1) the decision of May 9, that the South Carolina Dispensary law as amended on March 5, 1897, was still violative in some respects of the constitutional provision in regard to interstate commerce; (2) the decision on May 23, that, laws passed respectively by the legislatures of Pennsylvania and New Hampshire in respect to oleomargarine were invalid in so far as they related to oleomargarine imported from other States, whether or not the commodity was intended for wholesale or retail trade; (3) the maintenance of the right of the State to establish a system of inspection of articles of interstate commerce and to levy the requisite charges. An important decision under the Anti-Trust act was that rendered on October 24, the case of the *United States vs. The Joint Traffic Association*, which upheld the constitutionality of the Anti-Trust act and declared the Joint Traffic Association illegal. (See TRUSTS.) An important decision affecting the right of the States to tax foreign corporations was that of October 3, which decided in the case of *Parke, Davis & Company vs. the Comptroller of New York*, the State had authority to tax foreign corporations upon the capital which they employ within the State.

The November Elections.—The campaign issues in the Congressional elections were somewhat confused, and the results of these elections were variously interpreted. The Administration was naturally anxious to secure a popular verdict

upon its proposed policy in dealing with the new island territories, but this issue was obscured by the currency question, especially in the West. Outwardly there was not much sign of popular excitement as the elections approached. The policy which the President had outlined in his communication to the peace commissioners was the acquisition of the Philippines by the United States and their position in the immediate future. If the returns showed a great falling off in the Republican majority it would probably have been interpreted as a disapproval of this policy, and even of the policy of acquiring any foreign territory at all. If, on the other hand, the Republicans secured a decided victory at the polls the result would have been construed as a general endorsement of the plans outlined by the Administration. As to this specific question, the results were somewhat doubtful. The Republicans were found to be generally in favor of retaining the Philippines. The attitude of the Democrats was uncertain. In the West the free-silver issue was prominent. General Palmer, the candidate of the National Democrats in 1896, said that he considered the currency issue paramount and urged every one to vote for sound-money candidates. The chief doubtful States whose legislatures were required to re-elect Senators were New Jersey, California, Indiana, West Virginia, North Dakota, Washington and Nebraska. Of these, West Virginia, North Dakota, New Jersey, Indiana, California and Washington secured Republican majorities in the legislature, thus insuring the election of Republican Senators. In Nebraska a Populist majority was secured. As a result, the Republican majority in the Senate of the Fifty-sixth Congress will show a considerable increase over the previous majority. In the Fifty-fifth Congress there were 46 Republicans, 34 Democrats, 5 Populists, 2 members of the Silver party and 3 Independents. According to the nature of the majorities in the several States, the members of the new Senate would comprise 55 Republicans, 27 Democrats, 4 Populists, 2 members of the Silver party and 2 Independents, a gain for the Republicans of 9 and a loss to the Democrats of 8, and to the Populists and Independents of 1 each, thus giving the Republicans a majority of 10 and a plurality over the Democrats of 29. The House of Representatives in the Fifty-fifth Congress comprised 206 Republicans, 134 Democrats and 16 Populists. The elections returned 185 Republican members, 163 Democrats and 9 Populists, thus reducing the Republican majority from 56 to 13. The general result, therefore, was Republican gains in the Senate and losses in the House. It was taken by the expansionists as an endorsement of the policy of the Administration, but, on the other hand, the opponents of the Administration pointed to the Democratic gains in the large and populous States of New York, Pennsylvania, Massachusetts and Illinois. The Democrats construed this as a sign that the policy of expansion and the general conduct of the war were viewed with popular disfavor. For a further account of the State elections see the separate articles on the States.

For convenience of reference, we add in conclusion the full text of the President's message of Dec. 6, 1898, and of the treaty between the United States and Spain:

THE PRESIDENT'S MESSAGE.

To the Senate and House of Representatives: Notwithstanding the added burdens rendered necessary by the war, our people rejoice in a very satisfactory and steadily increasing degree of prosperity, evidenced by the largest volume of business ever recorded. Manufacture has been productive, agricultural pursuits have yielded abundant returns, labor in all fields of industry is better rewarded, revenue legislation passed by the present Congress has increased the Treasury's receipts to the amount estimated by its authors, the finances of the Government have been successfully administered and its credit advanced to the first rank, while its currency has been maintained at the world's highest standard. Military service under a common flag and for a righteous cause has strengthened the national spirit and served to cement more closely than ever the fraternal bonds between every section of the country.

A review of the relation of the United States to other powers, always appropriate, is this year of primary importance in view of the momentous issues which have arisen, demanding in one instance the ultimate determination by arms and involving far-reaching consequences which will require the earnest attention of the Congress. In my last annual message very full consideration was given to the question of the duty of the Government of the United States toward Spain and the Cuban insurrection as being by far the most important problem with which we have been called upon to deal. The considerations then advanced and the exposition of the views therein expressed disclosed my sense of the extreme gravity of the situation. Setting aside, as logically unfounded or practically inadmissible, the recognition of the Cuban insurgents as belligerents, the recognition of the independence of Cuba, neutral intervention to end the war by imposing a rational compromise between the contestants, intervention in favor of one or the other party, and forcible annexation of the island, I concluded it was honestly due to our friendly relations with Spain that she should be given a reasonable chance to realize her expectations of

reform to which she had become irrevocably committed. Within a few weeks previously she had announced comprehensive plans which it was confidently asserted would be efficacious to remedy the evils so deeply affecting our own country, so injurious to the true interests of the mother country, as well as to those of Cuba, and so repugnant to the universal sentiment of humanity. The ensuing month brought little sign of real progress toward the pacification of Cuba. The autonomous administrations set up in the capital and some of the principal cities appeared not to gain the favor of the inhabitants, or to be able to extend their influence to the large extent of territory held by the insurgents, while the military arm, obviously unable to cope with the still active rebellion, continued many of the most objectionable and offensive policies of the government that had preceded it. No tangible relief was afforded the vast numbers of unhappy reconcentrados despite the reiterated protestations made in that regard and the amount appropriated by Spain to that end. The preferred expedient of zones of cultivation proved illusory; indeed, no less practical nor more delusive promises of succor could well have been tendered to the exhausted and destitute people stripped of all that made life and home dear and herded in a strange region among unsympathetic strangers hardly less necessitous than themselves. By the end of December the mortality among them had frightfully increased. Conservative estimates from Spanish sources placed the deaths among these distressed people at over 40 per cent. from the time General Weyler's decree of reconcentration was enforced. With the acquiescence of the Spanish authorities a scheme was adopted for relief by charitable contributions raised in this country and distributed under the direction of the Consul-General and the several Consuls, by noble and earnest individual effort throughout the organized agencies of the American Red Cross. Thousands of lives were thus saved, but many thousands more were inaccessible to such forms of aid. The war continued on the old footing without comprehensive plan, developing only the same spasmodic encounters, barren of strategic result, that had marked the course of the earlier ten years' rebellion as well as the present insurrection from its start. No alternative save physical exhaustion of either combatant, and therewithal the practical ruin of the island, lay in sight, but how far distant no one could venture to conjecture.

The Outbreak of the War.—At this juncture, on the 15th of February last, occurred the destruction of the battleship *Maine* while rightfully lying in the harbor of Havana on a mission of international courtesy and good will—a catastrophe the suspicious nature and horror of which stirred the nation's heart profoundly. It is a striking evidence of the poise and sturdy good sense distinguishing our national character that this shocking blow, falling upon a generous people already deeply touched by preceding events in Cuba, did not move them to an instant desperate resolve to tolerate no longer the existence of a condition of danger and disorder at our doors that made possible such a deed, by whomsoever wrought. Yet the instinct of justice prevailed, and the nation anxiously awaited the result of a searching investigation at once set on foot. The finding of the Naval Board of Inquiry established that the origin of the explosion was external, by a submarine mine, and only halted, through lack of positive testimony, to fix the responsibility of its authorship. All these things carried conviction to the most thoughtful, even before the finding of the naval court, that a crisis in our relations with Spain and toward Cuba was at hand. So strong was this belief that it needed but a brief Executive suggestion to the Congress to receive immediate answer to the duty of making instant provision for the possible and perhaps speedily probable emergency of war, and the remarkable, almost unique, spectacle was presented of a unanimous vote of both houses on the 9th of March, appropriating \$50,000,000 "for the national defense and for each and every purpose connected therewith, to be expended at the discretion of the President." That this act of prevision came none too soon was disclosed when the application of the fund was undertaken. Our coasts were practically undefended. Our navy needed large provision for increased ammunition and supplies and even numbers to cope with any sudden attack from the navy of Spain, which comprised modern vessels of the highest type of continental perfection. Our army also required enlargement of men and munitions. The details of the hurried preparation for the dreaded contingency is told in the reports of the Secretaries of War and of the Navy, and need not be repeated here. It is sufficient to say that the outbreak of war, when it did come, found our nation not unprepared to meet the conflict. Nor was the apprehension of coming strife confined to our own country. It was felt by the continental powers, which, on April 6, through their Ambassadors and envoys, addressed to the Executive an expression of hope that humanity and moderation might mark the course of this Government and people, and that further negotiations would lead to an agreement which, while securing the maintenance of peace, would afford all necessary guarantees for the re-establishment of order in Cuba. In responding to that representation, I said I shared the hope the envoys had

expressed that the peace might be preserved in a manner to terminate the chronic condition of disturbance in Cuba, so injurious and menacing to our interests and tranquillity, as well as shocking to our sentiments of humanity, and, while appreciating the humanitarian and disinterested character of the communication they had made on behalf of the powers, stated the confidence of this Government, for its part, that equal appreciation would be shown for its own earnest and unselfish endeavors to fulfill a duty to humanity by ending a situation the indefinite prolongation of which had become insufferable.

Efforts to Maintain Peace.—Still animated by the hope of a peaceful solution and obeying the dictates of duty, no effort was relaxed to bring about a speedy ending of the Cuban struggle. Negotiations to this object continued actively with the Government of Spain, looking to the immediate conclusion of a six-months' armistice in Cuba, with a view to effect the recognition of her people's right to independence. Besides this, the instant revocation of the order of reconcentration was asked, so that the sufferers, returning to their homes and aided by united American and Spanish effort, might be put in a way to support themselves, and, by orderly resumption of the well-nigh destroyed productive energies of the island, contribute to the restoration of its tranquillity and well-being. Negotiations continued for some little time at Madrid, resulting in offers by the Spanish Government which could not but be regarded as inadequate. It was proposed to confine the preparation of peace to the insular parliament, yet to be convened under the autonomous decrees of November, 1897, but without impairment in any wise of the constitutional powers of the Madrid Government, which, to that end, would grant an armistice, if solicited by the insurgents, for such time as the General-in-Chief might see fit to fix. How and with what scope of discretionary powers the insular parliament was expected to set about the "preparation" of peace did not appear. If it were to be by negotiation with the insurgents the issue seemed to rest on the one side with a body chosen by a fraction of the electors in the districts under Spanish control, and on the other with the insurgent population holding the interior country, unrepresented in the so-called parliament and defiant at the suggestion of suing for peace. Grieved and disappointed at this barren outcome of my sincere endeavors to reach a practical solution, I felt it my duty to remit the whole question to the Congress. In the message of April 11, 1898, I announced that with this last overture in the direction of immediate peace in Cuba, and its disappointing reception by Spain, the effort of the Executive was brought to an end. I again reviewed the alternative courses of action which had been proposed, concluding that the only one consonant with international policy and compatible with our firm-set historical traditions was intervention as a neutral to stop the war and check the hopeless sacrifice of life, even though that resort involved "hostile constraint upon both the parties to the contest, as well to enforce a truce as to guide the eventual settlement." The grounds justifying that step were the interests of humanity, the duty to protect the life and property of our citizens in Cuba, the right to check injury to our commerce and people through the devastation of the island, and, most important, the need of removing at once and forever the constant menace and the burdens entailed upon our Government by the uncertainties and perils of the situation caused by the unendurable disturbances in Cuba. I said: "The long trial has proved that the object for which Spain has waged the war cannot be attained. The fire of insurrection may flame or may smolder, with varying seasons, but it has not been, and it is plain that it cannot be, extinguished by present methods. The only hope of relief and repose from a condition which can no longer be endured is in the enforced pacification of Cuba. In the name of humanity, in the name of civilization, in behalf of endangered American interests, which give us the right and the duty to speak and to act, the war in Cuba must stop."

Appeal to Congress.—In view of all this, the Congress was asked to authorize and empower the President to take measures to secure a full and final termination of hostilities between Spain and the people of Cuba, and to secure in the island the establishment of a stable government, capable of maintaining order and observing its international obligations, insuring peace and tranquillity, and the security of its citizens as well as our own, and, for the accomplishment of those ends, to use the military and naval forces of the United States, as might be necessary; with added authority to continue generous relief to the starving people of Cuba. The response of the Congress, after nine days of earnest deliberation, during which the almost unanimous sentiment of your body was developed on every point save as to the expediency of coupling the proposed action with a formal recognition of the Republic of Cuba as the true and lawful Government of that island—a proposition which failed of adoption—the Congress, after conference on the 19th of April, by a vote of 42 to 35 in the Senate, and 311 to 6 in the House of Representatives, passed the memorable joint resolution declaring:

First—That the people of the island of Cuba are and of right ought to be free and independent.

Second—That it is the duty of the United States to demand, and the Government of the United States does hereby demand, that the Government of Spain at once relinquish its authority and government in the island of Cuba, and withdraw its land and naval forces from Cuba and Cuban waters.

Third—That the President of the United States be, and he hereby is directed and empowered to use the entire land and naval forces of the United States, and to call into the actual service of the United States the militia of the several States to such extent as may be necessary to carry these resolutions into effect.

Fourth—That the United States hereby disclaims any disposition or intention to exercise sovereignty, jurisdiction, or control over said island, except for the pacification thereof, and asserts its determination when that is accomplished to leave the government and control of the island to its people.

This resolution was approved by the Executive on the next day, April 20. A copy was at once communicated to the Spanish Minister at this capital, who forthwith announced that his continuance in Washington had thereby become impossible, and asked for his passports, which were given him. He thereupon withdrew from Washington, leaving the protection of Spanish interests in the United States to the French Ambassador and the Austro-Hungarian Minister. Simultaneously with this communication to the Spanish Minister here, General Woodford, the American Minister at Madrid, was telegraphed confirmation of the text of the joint resolution and directed to communicate it to the Government of Spain, with the formal demand that it at once relinquish its authority and government in the island of Cuba and withdraw its forces therefrom, coupling this demand with the announcement of the intentions of this Government as to the future of the island, in conformity with the fourth clause of the resolution, and giving Spain until noon of April 23 to reply. That demand, although, as above shown, officially made known to the Spanish envoy here, was not delivered at Madrid. After the instruction reached General Woodford on the morning of April 21, but before he could present it, the Spanish Minister of State notified him that upon the President's approval of the joint resolution the Madrid Government, regarding the act as "equivalent to an evident declaration of war," had ordered its Minister in Washington to withdraw, thereby breaking off diplomatic relations between the two countries, and ceasing all official communication between their respective representatives. General Woodford thereupon demanded his passports and quitted Madrid the same day. Spain having thus denied the demand of the United States and initiated that complete form of rupture of relations which attends a state of war, the executive powers authorized by the resolution were at once used by me to meet the enlarged contingency of actual war between sovereign States. On April 22 I proclaimed a blockade of the north coast of Cuba, including ports on said coast between Cardenas and Bahia Honda, and the port of Cienfuegos, on the south coast of Cuba; and on the 23d I called for volunteers to execute the purpose of the resolution. By my message of April 25 the Congress was informed of the situation, and I recommended formal declaration of the existence of a state of war between the United States and Spain. The Congress accordingly voted on the same day the act approved April 25, 1898, declaring the existence of such war from and including the 21st day of April, and re-enacted the provision of the resolution of April 20 directing the President to use all the armed forces of the nation to carry that act into effect. Due notification of the existence of war as aforesaid was given April 25 by telegraph to all the Governments with which the United States maintain relations, in order that their neutrality might be assured during the war. The various Governments responded with proclamations of neutrality, each after its own method. It is not among the least gratifying incidents of the struggle that the obligations of neutrality were impartially discharged by all, often under delicate and difficult circumstances.

In further fulfillment of international duty I issued, April 26, 1898, a proclamation announcing the treatment proposed to be accorded to vessels and their cargoes as to blockade, contraband, the exercise of the right of search, and the immunity of neutral flags and neutral goods under enemy's flag. A similar proclamation was made by the Spanish Government. In the conduct of hostilities the rules of the Declaration of Paris, including abstention from resort to privateering, have accordingly been observed by both belligerents, although neither was a party to that declaration.

The Call for Volunteers.—Our country thus, after an interval of half a century of peace with all nations, found itself engaged in deadly conflict with a foreign enemy. Every nerve was strained to meet the emergency. The response to the initial call for 125,000 volunteers was instant and complete, as was also the result of the second call of May 25 for 75,000 additional volunteers. The ranks of the regular army were increased to the limits provided by the act of April 26, 1898. The enlisted force of the navy on the 15th day of August, when it reached its maximum, numbered 24,123 men and apprentices. One hundred and three vessels

were added to the navy by purchase, one was presented to the Government, one leased, and the four vessels of the International Navigation Company—the *St. Paul*, *St. Louis*, *New York* and *Paris*—were chartered. In addition to these the revenue cutters and lighthouse tenders were turned over to the Navy Department, and became temporarily a part of the auxiliary navy. The medium effective fighting force of the navy during the war, separated into classes, was as follows: 4 battleships of the first class; 1 battleship of the second class, 2 armored cruisers; 6 coast-defense monitors, 1 armored ram, 12 protected cruisers, 3 unprotected cruisers, 18 gunboats, 1 dynamite cruiser, 11 torpedo-boats; vessels of the old navy, including monitors, 14. Auxiliary—11 auxiliary cruisers, 28 converted yachts, 27 converted tugs, 19 converted colliers, 15 revenue cutters, 7 lighthouse tenders and 19 miscellaneous vessels. Much alarm was felt along our entire Atlantic seaboard lest some attack might be made by the enemy. Every precaution was taken to prevent possible injury to our great cities lying along the coast. Temporary garrisons were provided, drawn from the State militia; infantry and light batteries were drawn from the volunteer force. About 12,000 troops were thus employed. The coast signal service was established for observing the approach of an enemy's ships to the coast of the United States, and the life-saving and lighthouse services co-operated, which enabled the Navy Department to have all portions of the Atlantic coast, from Maine to Texas, under observation.

Naval Preparations.—The auxiliary navy was created under the authority of Congress, and was officered and manned by the naval militia of the several States. This organization patrolled the coast, and performed the duty of a second line of defense. Under the direction of the Chief of Engineers, submarine mines were placed at the most exposed points. Before the outbreak of the war permanent mining casements and cable galleries had been constructed at nearly all important harbors. Most of the torpedo material was not to be found in the market, and had to be specially manufactured. Under date of April 19, district officers were directed to take all preliminary measures, short of the actual attaching of the loaded mines to the cables, and on April 22 telegraphic orders were issued to place the loaded mines in position. The aggregate number of mines placed was 1,535, at the principal harbors from Maine to California. Preparations were also made for the planting of mines at certain other harbors, but, owing to the early destruction of the Spanish fleet, these mines were not placed. The signal corps was promptly organized, and performed service of the most difficult and important character. Its operations during the war covered the electrical connection of all coast fortifications, the establishment of telephonic and telegraphic facilities for the camps at Manila, Santiago and in Porto Rico. There were constructed 300 miles of line at ten great camps, thus facilitating military movements from these points in a manner heretofore unknown in military administration. Field telegraph lines were established and maintained under the enemy's fire at Manila, and later the Manila-Hongkong cable was reopened. In Porto Rico cable communications were opened over a discontinued route, and on land the headquarters of the commanding officer was kept in telegraphic or telephonic communication with the division commanders on four different lines of operations. There was placed in Cuban waters a completely outfitted cable ship, with war cables and cable gear, suitable both for the destruction of communications belonging to the enemy and the establishment of our own. Two ocean cables were destroyed under the enemy's batteries at Santiago. The day previous to the landing of General Shafter's corps at Caimanera, within twenty miles of the landing place, cable communications were established and a cable station opened, giving direct communication with the Government at Washington. This service was invaluable to the Executive in directing the operations of the army and navy. With a total force of over 1,300, the loss was by disease in camp and field, officers and men included, only five. The National Defense Fund of \$50,000,000 was expended in large part by the army and navy, and the objects for which it was used are fully shown in the reports of the several Secretaries. It was a most timely appropriation, enabling the Government to strengthen its defenses and make preparations greatly needed in case of war. This fund being inadequate to the requirements of equipment and for the conduct of the war, the patriotism of the Congress provided the means in the War Revenue act of June 13, by authorizing a 3 per cent. popular loan not to exceed \$400,000,000, and by levying additional imposts and taxes. Of the authorized loan \$200,000,000 were offered and promptly taken, the subscriptions so far exceeding the call as to cover it many times over, while preference being given to the smaller bids, no single allotment exceeded \$5,000. This was a most encouraging and significant result, showing the vast resources of the nation, and the determination of the people to uphold their country's honor. It is not within the province of this message to narrate the history of the extraordinary war that followed the Spanish declaration of April 21, but a brief recital of its more salient features is appropriate.

History of the War.—The first encounter of the war in point of date took place April 27, when a detachment of the blockading squadron made a reconnoissance in force at Matanzas, shelled the harbor forts, and demolished several works in course of construction. The next engagement was destined to mark a memorable epoch in marine warfare. The Pacific fleet, under Commodore George Dewey, had lain for some weeks at Hongkong. Upon the colonial proclamation of neutrality being issued, and the customary twenty-four hours' notice being given, it repaired to Mirs Bay, near Hongkong, whence it proceeded to the Philippine Islands under telegraphic orders to capture or destroy the formidable Spanish fleet then assembled at Manila. At daybreak on the 1st of May the American force entered Manila Bay, and after a few hours' engagement effected the total destruction of the Spanish fleet, consisting of ten warships and a transport, besides capturing the naval station and forts at Cavité, thus annihilating the Spanish naval power in the Pacific Ocean and completely controlling the Bay of Manila, with the ability to take the city at will. Not a life was lost on our ships, the wounded only numbering seven, while not a vessel was materially injured. For this gallant achievement the Congress, upon my recommendation, fitly bestowed upon the actors permanent and substantial reward. The effect of this remarkable victory upon the spirit of our people and upon the fortunes of the war was instant. A prestige of invincibility thereby attached to our arms, which continued throughout the struggle. Reinforcements were hurried to Manila, under the command of Major-General Merritt, and firmly established within sight of the capital, which lay helpless before our guns. On the 7th day of May the Government was advised officially of the victory at Manila, and at once inquired of the commander of our fleet what troops would be required. The information was received on the 15th day of May, and the first army expedition sailed May 25, and arrived off Manila June 30. Other expeditions soon followed, the total force consisting of 641 officers and 15,058 enlisted men. Only reluctance to cause needless loss of life and property prevented the early storming and capture of the city, and therewith the absolute military occupancy of the whole group. The insurgents meanwhile had resumed the active hostilities, suspended by the uncompleted truce of December, 1897. Their forces invested Manila from the northern and eastern sides, but were constrained by Admiral Dewey and General Merritt from attempting an assault. It was fitting that whatever was to be done in the way of decisive operations in that quarter should be accomplished by the strong arm of the United States alone. Obeying the stern precept of war, which enjoins the overcoming of the adversary and the extinction of his power wherever assailable as the speedy and sure means to win a peace, divided victory was not permissible, for no partition of the rights and responsibilities attending the enforcement of a just and advantageous peace could be thought of. Following the comprehensive scheme of general attack, powerful forces were assembled at various points on our coast to invade Cuba and Porto Rico. Meanwhile naval demonstrations were made at several exposed points. On May 11 the cruiser *Wilmington* and the torpedo boat *Winslow* were unsuccessful in an attempt to silence the batteries at Cardenas, a gallant ensign, Worth Bagley, and four seamen falling. These grievous fatalities were strangely enough among the very few which occurred during our naval operations in this extraordinary conflict. Meanwhile the Spanish naval preparations had been pushed with great vigor. A powerful squadron, under Admiral Cervera, which had assembled at the Cape Verde Islands before the outbreak of hostilities, had crossed the ocean, and by its erratic movements in the Caribbean Sea delayed our military plans, while baffling the pursuit of our fleets. For a time fears were felt lest the *Oregon* and the *Marietta*, then nearing home after their long voyage from San Francisco of over 15,000 miles, might be surprised by Admiral Cervera's fleet; but their fortunate arrival dispelled these apprehensions and lent much needed reinforcement. Not until Admiral Cervera took refuge in the harbor of Santiago de Cuba, about May 19, was it practicable to plan a systematic naval and military attack upon the Antillean possessions of Spain. Several demonstrations occurred on the coasts of Cuba and Porto Rico in preparation for the larger event. On May 13 the North Atlantic squadron shelled San Juan de Puerto Rico. On May 30 Commodore Schley's squadron bombarded the forts guarding the mouth of Santiago harbor. Neither attack had any material result. It was evident that well-ordered land operations were indispensable to achieve a decisive advantage.

The next act in the war thrilled not alone the hearts of our countrymen, but the world, by its exceptional heroism. On the night of June 3, Lieutenant Hobson, aided by seven devoted volunteers, blocked the narrow outlet from Santiago harbor by sinking the collier *Merrimac* in the channel under a fierce fire from the shore batteries, escaping with their lives as by a miracle, but falling into the hands of the Spaniards. It is a most gratifying incident of the war that the bravery of this little band of heroes was cordially appreciated by the Spanish admiral, who sent a flag of

truce to notify Admiral Sampson of their safety and to compliment them on their daring act. They were subsequently exchanged July 7.

By June 7 the cutting of the last Cuban cable isolated the island. Thereafter the invasion was vigorously prosecuted. On June 10, under a heavy protecting fire, a landing of 600 marines from the *Oregon*, *Marblehead* and *Yankee* was effected in Guantanamo Bay, where it had been determined to establish a naval station. This important and essential port was taken from the enemy after severe fighting by the marines, who were the first organized force of the United States to land in Cuba. The position so won was held despite desperate attempts to dislodge our forces. By June 16 additional forces were landed and strongly entrenched. On June 22 the advance of the invading army, under Major-General Shafter, landed at Daiquiri, about fifteen miles east of Santiago. This was accomplished under great difficulties, but with marvelous dispatch. On June 23 the movement against Santiago was begun. On the 24th the first serious engagement took place, in which the First and Tenth Cavalry and the First United States Volunteer Cavalry, General Young's brigade of General Wheeler's division, participated, losing heavily. By nightfall, however, ground within five miles of Santiago was won. The advantage was steadily increased. On July 1 a severe battle took place, our forces gaining the outworks of Santiago. On the 2d El Caney and San Juan were taken after a desperate charge, and the investment of the city was completed. The navy co-operated by shelling the town and the coast forts.

On the day following this brilliant achievement of our land forces, the 3d of July, occurred the decisive naval combat of the war. The Spanish fleet, attempting to leave the harbor, was met by the American squadron under command of Commodore Sampson. In less than three hours all the Spanish ships were destroyed, the two torpedo boats being sunk, and the *Maria Teresa*, *Almirante Oquendo*, *Viscaya* and *Cristobal Colon* driven ashore. The Spanish admiral and over 1,300 men were taken prisoners, while the enemy's loss of life was deplorably large, some 600 perishing. On our side but one man was killed, on the *Brooklyn*, and one man seriously wounded. Although our ships were repeatedly struck, not one was seriously injured. Where all so conspicuously distinguished themselves, from the commanders to the gunners and the unnamed heroes in the boiler rooms, each and all contributing toward the achievement of this astounding victory, for which neither ancient nor modern history affords a parallel in the completeness of the event and the marvelous disproportion of casualties, it would be invidious to single out any for especial honor. Deserved promotion has rewarded the more conspicuous actors—the nation's profoundest gratitude is due to all of these brave men who by their skill and devotion in a few short hours crushed the sea power of Spain and wrought a triumph whose decisiveness and far-reaching consequences can scarcely be measured. Nor can we be unmindful of the achievements of our builders, mechanics and artisans for their skill in the construction of our warships. With the catastrophe of Santiago, Spain's effort upon the ocean virtually ceased. A spasmodic effort toward the end of June to send her Mediterranean fleet, under Admiral Camara, to relieve Manila was abandoned, the expedition being recalled after it had passed through the Suez Canal.

The capitulation of Santiago followed. The city was closely besieged by land, while the entrance of our ships into the harbor cut off all relief on that side. After a truce to allow for the removal of non-combatants, protracted negotiations continued from July 3 until July 15, when, under menace of immediate assault, the preliminaries of surrender were agreed upon. On the 17th General Shafter occupied the city. The capitulation embraced the entire eastern end of Cuba. The number of Spanish soldiers surrendering was 22,000, all of whom were subsequently conveyed to Spain at the charge of the United States. The story of this successful campaign is told in the report of the Secretary of War, which will be laid before you. The individual valor of officers and soldiers was never more strikingly shown than in the several engagements leading to the surrender of Santiago, while the prompt movements and successive victories won instant and universal applause. To those who gained this complete triumph, which established the ascendancy of the United States upon land as the fight off Santiago had fixed our supremacy on the seas, the earnest and lasting gratitude of the nation is unsparingly due. Nor should we alone remember the gallantry of the living, the dead claim our tears, and our losses by battle and disease must cloud any exultation at the result and teach us to weigh the awful cost of war, however rightful the cause or signal the victory.

With the fall of Santiago the occupation of Porto Rico became the next strategic necessity. General Miles had previously been assigned to organize an expedition for that purpose. Fortunately he was already at Santiago, where he had arrived on the 11th of July with reinforcements for General Shafter's army. With these troops, consisting of 3,415 infantry and artillery, two companies of engineers, and one company of the Signal Corps, General Miles left Guantanamo on July 21.

having nine transports convoyed by the fleet under Captain Higginson, with the *Massachusetts*, flagship; *Dixie*, *Gloucester*, *Columbia*, and *Yale*, the two latter carrying troops. The expedition landed at Guanica July 25, which port was entered with little opposition. Here the fleet was joined by the *Annapolis* and the *Wasp*, while the *Puritan* and *Amphitrite* went to San Juan and joined the *New Orleans*, which was engaged in blockading that port. The Major-General commanding was subsequently reinforced by General Schwan's brigade of the Third Army Corps, by General Wilson with a part of his division, and also by General Brooke with a part of his corps, numbering in all 16,973 officers and men. On July 27 he entered Ponce, one of the most important ports in the island, from which he thereafter directed operations for the capture of the island. With the exception of encounters with the enemy at Guayama, Hormigueros, Coamo and Yauco, and an attack on a force landed at Cape San Juan, there was no serious resistance. The campaign was prosecuted with great vigor, and by the 12th of August much of the island was in our possession, and the acquisition of the remainder was only a matter of a short time. At most of the points in the island our troops were enthusiastically welcomed. Protestations of loyalty to the flag and gratitude for delivery from Spanish rule met our commanders at every stage. As a potent influence toward peace the outcome of the Porto Rican expedition was of great consequence, and generous commendation is due to those who participated in it.

The last scene of the war was enacted at Manila—its starting place. On August 15, after a brief assault upon the works by the land forces, in which the squadron assisted, the capital surrendered unconditionally. The casualties were comparatively few. By this the conquest of the Philippine Islands, virtually accomplished when the Spanish capacity for resistance was destroyed by Admiral Dewey's victory of the 1st of May, was formally sealed. To General Merritt, his officers and men, for their uncomplaining and devoted service and for their gallantry in action, the nation is sincerely grateful. Their long voyage was made with singular success, and the soldierly conduct of the men, most of whom were without previous experience in the military service, deserves unmeasured praise.

2 The total casualties in killed and wounded in the army during the war with Spain were: Officers killed, 23; enlisted men killed, 257; total, 280. Officers wounded, 113; enlisted men wounded, 1,464; total, 1,577. Of the navy: Killed, 17; wounded, 67; died as a result of wounds, 1; invalided from service, 6; total, 91. It will be observed that while our navy was engaged in two great battles and in numerous perilous undertakings in blockade and bombardment, and more than 50,000 of our troops were transported to distant lands and were engaged in assault and siege and battle and many skirmishes in unfamiliar territory, we lost in both arms of the service a total of 1,668 killed and wounded, and in the entire campaign by land and sea we did not lose a gun or a flag or a transport or a ship, and with the exception of the crew of the *Merrimac* not a soldier or sailor was taken prisoner. On August 7, forty-six days from the date of the landing of General Shafter's army in Cuba and twenty-one days from the surrender of Santiago, the United States troops commenced embarkation for home, and our entire force was returned to the United States as early as August 24. They were absent from the United States only two months. It is fitting that I should bear testimony to the patriotism and devotion of that large portion of our army which, although eager to be ordered to the post of greatest exposure, fortunately was not required outside of the United States. They did their whole duty, and, like their comrades at the front, have earned the gratitude of the nation. In like manner the officers and men of the army and of the navy who remained in their departments and stations, faithfully performing most important duties connected with the war, and whose requests for assignment in the field and at sea I was compelled to refuse, because their services were indispensable here, are entitled to the highest commendation. It is my regret that there seems to be no provision for their suitable recognition. In this connection it is a pleasure for me to mention in terms of cordial appreciation the timely and useful work of the American National Red Cross, both in relief measures preparatory to the campaigns, in sanitary assistance at several of the camps of assemblage, and later, under the able and experienced leadership of the president of the society, Miss Clara Barton, on the fields of battle and in the hospitals at the front in Cuba. Working in conjunction with the governmental authorities, and under their sanction and approval, and with the enthusiastic co-operation of many patriotic women and societies in the various States, the Red Cross has fully maintained its already high reputation for intense earnestness and ability to exercise the noble purposes of its international organization, thus justifying the confidence and support which it has received at the hands of the American people. To the members and officers of this society and all who aided them in philanthropic work the sincere and lasting gratitude of the soldiers and the public is due and is freely accorded. In tracing these events we are constantly reminded of our obligations

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to the Divine Master for His watchful care over us and His safe guidance, for which the nation makes reverent acknowledgment and offers humble prayer for the continuance of His favor.

The Making of Peace.—The annihilation of Admiral Cervera's fleet, followed by the capitulation of Santiago, having brought to the Spanish Government a realizing sense of the hopelessness of continuing a struggle now become wholly unequal, it made overtures of peace through the French Ambassador, who, with the assent of his Government, had acted as the friendly representative of Spanish interests during the war. On the 26th of July M. Cambon presented a communication signed by the Duke of Almodovar, the Spanish Minister of State, inviting the United States to state the terms upon which it would be willing to make peace. On the 30th of July, by a communication addressed to the Duke of Almodovar and handed to M. Cambon, the terms of this Government were announced, substantially as in the protocol afterward signed. On the 10th of August the Spanish reply, dated August 7, was handed by M. Cambon to the Secretary of State. It accepted unconditionally the terms imposed as to Cuba, Porto Rico and an island of the Ladrone group, but appeared to seek to introduce inadmissible reservations in regard to our demand as to the Philippine Islands. Conceiving that discussion on this point could neither be practical nor profitable, I directed that, in order to avoid misunderstanding, the matter should be forthwith closed by proposing the embodiment in a formal protocol of the terms upon which the negotiations for peace were to be undertaken. The vague and inexplicit suggestions of the Spanish note could not be accepted, the only reply being to present as a virtual ultimatum a draft of protocol embodying the precise terms tendered to Spain in our note of July 30, with added stipulations of detail as to the appointment of commissioners to arrange for the evacuation of the Spanish Antilles. On August 12 M. Cambon announced his receipt of full powers to sign the protocol so submitted. Accordingly, on the afternoon of August 12, M. Cambon, as the plenipotentiary of Spain, and the Secretary of State, as the plenipotentiary of the United States, signed a protocol providing—

Article I. Spain will relinquish all claim of sovereignty over and title to Cuba.

Article II. Spain will cede to the United States the island of Porto Rico and other islands now under Spanish sovereignty in the West Indies, and also an island in the Ladrone group to be selected by the United States.

Article III. The United States will occupy and hold the city, bay and harbor of Manila pending the conclusion of a treaty of peace which shall determine the control, disposition and government of the Philippines.

The fourth article provided for the appointment of joint commissions on the part of the United States and Spain, to meet in Havana and San Juan, respectively, for the purpose of arranging and carrying out the details of the stipulated evacuation of Cuba, Porto Rico and other Spanish islands in the West Indies.

The fifth article provided for the appointment of not more than five Commissioners on each side to meet at Paris not later than October 1 and to proceed to the negotiation and conclusion of a treaty of peace, subject to ratification according to the respective constitutional forms of the two countries.

The sixth and last article provided that upon the signature of the protocol hostilities between the two countries should be suspended, and that notice to that effect should be given as soon as possible by each government to the commanders of its military and naval forces.

Immediately upon the conclusion of the protocol I issued a proclamation on August 12 suspending hostilities on the part of the United States. The necessary orders to that end were at once given by telegraph. The blockade of the ports of Cuba and San Juan de Puerto Rico was in like manner raised. On the 18th of August the muster-out of 100,000 volunteers, or as near that number as was found to be practicable, was ordered. On the 1st of December 101,165 officers and men had been mustered out and discharged from the service, and 9,002 more will be mustered out by the 10th of this month. Also a corresponding number of general and general staff officers have been honorably discharged the service. The military commissions to superintend the evacuation of Cuba, Porto Rico and the adjacent islands were forthwith appointed: For Cuba, Major-General James F. Wade, Rear-Admiral William T. Sampson, Major-General Matthew C. Butler; for Porto Rico, Major-General John R. Brooke, Rear-Admiral Winfield S. Schley, Brigadier-General William W. Gordon, who soon afterward met the Spanish Commissioners at Havana and San Juan respectively. The Porto Rican joint commission speedily accomplished its task, and by the 18th of October the evacuation of the island was completed. The United States flag was raised over the island at noon of that day. The administration of its affairs has been provisionally intrusted to a military governor until the Congress shall otherwise provide. The Cuban joint commission has not yet terminated its labors. Owing to the difficulties in the way of removing the large numbers of Spanish troops still in Cuba, the

evacuation cannot be completed before the 1st of January next. Pursuant to the fifth article of the protocol, I appointed William R. Day, lately Secretary of State; Cushman K. Davis, William P. Frye, and George Gray, Senators of the United States, and Whitelaw Reid, to be the Peace Commissioners on the part of the United States. Proceeding in due season to Paris, they there met on the 1st of October five Commissioners, similarly appointed on the part of Spain. Their negotiations have made hopeful progress, so that I trust soon to be able to lay a definite treaty of peace before the Senate, with a review of the steps leading to its signature.

Our Colonial Possessions.—I do not discuss at this time the government or the future of the new possessions which will come to us as the result of the war with Spain. Such discussion will be appropriate after the treaty of peace shall be ratified. In the meantime, and until the Congress has legislated otherwise, it will be my duty to continue the military governments which have existed since our occupation, and give to the people security in life and property and encouragement under a just and beneficent rule. As soon as we are in possession of Cuba and have pacified the island, it will be necessary to give aid and direction to its people to form a government for themselves. This should be undertaken at the earliest moment consistent with safety and assured success. It is important that our relations with this people shall be of the most friendly character and our commercial relations close and reciprocal. It should be our duty to assist in every proper way to build up the waste places of the island, encourage the industry of the people, and assist them to form a government which shall be free and independent, thus realizing the best aspirations of the Cuban people. Spanish rule must be replaced by a just, benevolent and humane government, created by the people of Cuba, capable of performing all international obligations, and which shall encourage thrift, industry and prosperity, and promote peace and good-will among all of the inhabitants, whatever may have been their relations in the past. Neither revenge nor passion should have a place in the new government. Until there is complete tranquillity in the island and a stable government inaugurated military occupation will be continued. With the one exception of the rupture with Spain the intercourse of the United States with the great family of nations has been marked with cordiality, and the close of the eventful year finds most of the issues that necessarily arise in the complex relations of sovereign states adjusted or presenting no serious obstacle to a just and honorable solution by amicable agreement.

South American Countries.—A long unsettled dispute as to the extended boundary between the Argentine Republic and Chile, stretching along the Andean crests from the southern border of the Atacama desert to Magellan Straits, nearly a third of the length of the South American continent, assumed an acute stage in the early part of the year, and afforded to this Government occasion to express the hope that the resort to arbitration, already contemplated by existing conventions between the parties, might prevail despite the grave difficulties arising in its application. I am happy to say that arrangements to this end have been perfected, the questions of fact upon which the respective Commissioners were unable to agree being in course of reference to her Britannic Majesty for determination. A residual difference touching the northern boundary line across the Atacama desert, for which existing treaties provided no adequate adjustment, bids fair to be settled in like manner by a joint commission, upon which the United States Minister at Buenos Ayres has been invited to serve as umpire in the last resort. I have found occasion to approach the Argentine Government with a view to removing differences of rate charges imposed upon the cables of an American corporation in the transmission between Buenos Ayres and the cities of Uruguay and Brazil, of through messages, passing from and to the United States. Although the matter is complicated by exclusive concessions by Uruguay and Brazil to foreign companies, there is strong hope that a good understanding will be reached and that the important channels of commercial communication between the United States and the Atlantic cities of South America may be freed from an almost prohibitory discrimination. In this relation, I may be permitted to express my sense of the fitness of an international agreement whereby the interchange of messages over connecting cables may be regulated on a fair basis of uniformity. The world has seen the postal system developed from a congeries of independent and exclusive services into a well-ordered union, of which all countries enjoy the manifold benefits. It would be strange were the nations not in time brought to realize that modern civilization, which owes so much of its progress to the annihilation of space by the electric force, demands that this all-important means of communication be a heritage of all peoples, to be administered and regulated in their common behoof. A step in this direction was taken when the international convention of 1884 for the protection of submarine cables was signed, and the day is, I trust, not far distant when this medium for the transmission of thought from land to land may be

brought within the domain of international concert as completely as is the material carriage of commerce and correspondence upon the face of the waters that divide them. The claim of Thomas Jefferson Page against Argentina, which has been pending many years, has been adjusted. The sum awarded by the Congress of Argentina was \$4,242.35.

The sympathy of the American people has justly been offered to the ruler and the people of Austria-Hungary by reason of the affliction that has lately befallen them in the assassination of the Empress-Queen of that historic realm.

The Miners' Strike.—On the 10th of September, 1897, a conflict took place at Lattimer, Penn., between a body of striking miners and the Sheriff of Luzerne County and his deputies, in which 22 miners were killed and 44 wounded, of whom 10 of the killed and 12 of the wounded were Austrian and Hungarian subjects. This deplorable event naturally aroused the solicitude of the Austro-Hungarian Government, which, on the assumption that the killing and wounding involved the unjustifiable use of authority, claimed reparation for the sufferers. Apart from the searching investigation and peremptory action of the authorities of Pennsylvania, the Federal Executive took appropriate steps to learn the merits of the case, in order to be in a position to meet the urgent complaint of a friendly power. The sheriff and his deputies, having been indicted for murder, were tried and acquitted after protracted proceedings and the hearing of hundreds of witnesses, on the ground that the killing was in the line of their official duty to uphold law and preserve public order in the State. A representative of the Department of Justice attended the trial and reported its course fully. With all the facts in its possession, this Government expects to reach a harmonious understanding on the subject with that of Austria-Hungary, notwithstanding the renewed claim of the latter, after learning the result of the trial, for indemnity for its injured subjects.

Despite the brief time allotted for preparation, the exhibits of this country at the universal exposition at Brussels in 1897 enjoyed the singular distinction of a larger proportion of awards, having regard to the number and classes of articles entered, than those of other countries. The worth of such a result in making known our national capacity to supply the world's markets is obvious.

Commercial Relations.—Exhibitions of this international character are becoming more frequent as the exchanges of commercial countries grow more intimate and varied. Hardly a year passes that this Government is not invited to national participation at some important foreign centre, but often on too short notice to permit of recourse to Congress for the power and means to do so. My predecessors have suggested the advisability of providing by a general enactment and a standing appropriation for accepting such invitations, and for representation of this country by a commission. This plan has my cordial approval. I trust that the Belgian restrictions on the importation of cattle from the United States, originally adopted as a sanitary precaution, will at an early day be relaxed as to their present features of hardship and discrimination, so as to admit live cattle under due regulation of their slaughter after landing. I am hopeful, too, of favorable change in the Belgian treatment of our preserved and salted meats. The growth of direct trade between the two countries, not alone for Belgian consumption and Belgian products, but by way of transit from and to other Continental States, has been both encouraging and beneficial. No effort will be spared to enlarge its advantages by seeking the removal of needless impediments and by arrangements for increased commercial exchanges.

Central America.—The year's events in Central America deserve more than passing mention. A menacing rupture between Costa Rica and Nicaragua was happily composed by the signature of a convention between the parties, with the concurrence of the Guatemalan representative as a mediator, the act being negotiated and signed on board the United States steamer *Alert*, then lying in Central American waters. It is believed that the good offices of our envoy and of the commander of that vessel contributed toward this gratifying outcome. In my last annual message the situation was presented with respect to the diplomatic representation of this Government in Central America, created by the association of Nicaragua, Honduras and Salvador under the title of the Greater Republic of Central America, and the declaration of their international functions to the Diet thereof. While the representative character of the Diet was recognized by my predecessor, and has been confirmed during my administration by receiving its accredited envoy and granting exequaturs to Consuls commissioned under its authority, that recognition was qualified by the distinct understanding that the responsibility of each of the component sovereign republics toward the United States remained wholly unaffected. This proviso was needful, inasmuch as the compact of the three republics was at the outset an association whereby certain representative functions were delegated to a tripartite commission, rather than a federation possessing centralized powers of government and administration. In this view of their relation, and of the relation

of the United States to the several republics, a change in the representation of this country in Central America was neither recommended by the Executive nor initiated by Congress; thus leaving one of our envoys accredited, as heretofore, separately to two States of the greater republic, Nicaragua and Salvador, and to a third State, Costa Rica, which was not a party to the compact, while our other envoy was similarly accredited to a union State—Honduras—and a non-union State—Guatemala. The result has been that the one has presented credentials only to the President of Costa Rica, the other having been received only by the Government of Guatemala. Subsequently, the three associated republics entered into negotiations for taking the steps forecast in the original compact. A convention of their delegates framed for them a Federal Constitution under the name of the United States of Central America, and provided for a central Federal Government and legislature. Upon ratification by the constituent States, the 1st of November last was fixed for the new system to go into operation. Within a few weeks thereafter the plan was severely tested by revolutionary movements arising, with a consequent demand for unity of action on the part of the military power of the federal States to suppress them. Under this strain the new union seems to have been weakened through the withdrawal of its more important members. This Government was not officially advised of the installation of the federation, and has maintained an attitude of friendly expectancy, while in no wise relinquishing the position held from the outset that the responsibilities of the several States toward us remained unaltered by their tentative relations among themselves.

The Nicaragua Canal.—The Nicaragua Canal Commission under the chairmanship of Rear-Admiral John G. Walker, appointed July 24, 1897, under the authority of a provision in the Sundry Civil act of June 4 of that year, has nearly completed its labors, and the results of its exhaustive inquiry into the proper route, the feasibility and the cost of construction of an inter-oceanic canal by a Nicaraguan route will be laid before you. In the performance of its task the Commission received all possible courtesy and assistance from the governments of Nicaragua and Costa Rica, which thus testified their appreciation of the importance of giving a speedy and practical outcome to the great project that has for so many years engrossed the attention of the respective countries. As the scope of the recent inquiry embraced the whole subject with the aim of making plans and surveys for a canal by the most convenient route, it necessarily included a review of the result of previous surveys and plans, and in particular those adopted by the Maritime Canal Company under its existing concessions from Nicaragua and Costa Rica, so that to this extent those grants necessarily hold as essential a part in the deliberations and concessions of the canal commission as they have held and must needs hold in the discussion of the matter by the Congress. Under these circumstances and in view of overtures made to the governments of Nicaragua and Costa Rica by other parties for a new canal concession predicted on the assumed approaching lapse of the contracts of the Maritime Canal Company with those States, I have not hesitated to express my conviction that considerations of expediency and international policy as between the several governments interested in the construction and control of an inter-oceanic canal by this route require the maintenance of the *status quo* until the Canal Commission shall have reported and the United States Congress shall have had the opportunity to pass finally upon the whole matter during the present session, without prejudice by reason of any change in the existing conditions. Nevertheless, it appears that the Government of Nicaragua, as one of its last sovereign acts before merging its powers in those of the newly formed United States of Central America, has granted an optional concession to another association to become effective on the expiration of the present grant. It does not appear what surveys have been made or what route is proposed under this contingent grant, so that an examination of the feasibility of its plans is necessarily not embraced in the report of the Canal Commission. All those circumstances suggest the urgency of some definite action by the Congress at this session if the labors of the past are to be utilized and the linking of the Atlantic and Pacific Oceans by a practical waterway is to be realized. That the construction of such a maritime highway is now more than ever indispensable to that intimate and ready inter-communication between our eastern and western seabords demanded by the annexation of the Hawaiian Islands and the prospective expansion of our influence and commerce in the Pacific, and that our national policy now more imperatively than ever calls for its control by this Government, are propositions which I doubt not the Congress will duly appreciate and wisely act upon.

The Chilean Claims Commission.—A convention providing for the revival of the late United States and Chilean Claims Commission, and the consideration of claims which were duly presented to the late Commission, but not considered because of the expiration of the time limited for the duration of the Commission, was signed May

24, 1897, and has remained unacted upon by the Senate. The term therein fixed for effecting the exchange of ratifications having elapsed, the convention falls unless the time be extended by amendment, which I am endeavoring to bring about, with the friendly concurrence of the Chilean Government.

Attitude toward China.—The United States has not been an indifferent spectator of the extraordinary events transpiring in the Chinese Empire, whereby portions of its maritime provinces are passing under the control of various European powers; but the prospect that the vast commerce which the energy of our citizens and the necessity of our staple productions for Chinese uses has built up in those regions may not be prejudiced through any exclusive treatment by the new occupants has obviated the need of our country becoming an actor in the scene. Our position among nations, having a large Pacific coast and a constantly expanding direct trade with the farther Orient, gives us the equitable claim to consideration and friendly treatment in this regard, and it will be my aim to subserve our large interests in that quarter by all means appropriate to the constant policy of our Government. The territories of Kiao-Chau, of Wei-Hai-Wei, and of Port Arthur and Talienwan, leased to Germany, Great Britain, and Russia, respectively, for terms of years, will, it is announced, be open to international commerce during such alien occupation; and if no discriminating treatment of American citizens and their trade be found to exist, or be hereafter developed, the desire of this Government would appear to be realized. In this relation, as showing the volume and value of our exchanges with China, and the peculiarly favorable conditions which exist for their expansion in the normal course of trade, I refer to the communication addressed to the Speaker of the House of Representatives by the Secretary of the Treasury on the 14th of last June with its accompanying letter of the Secretary of State, recommending an appropriation for a commission to study the commercial and industrial conditions in the Chinese Empire, and report as to the opportunities for and obstacles to the enlargement of markets in China for the raw products and manufactures of the United States. Action was taken thereon during the late session. I cordially urge that the recommendation receive at your hands the consideration which its importance and timeliness merit. Meanwhile there may be just ground for disquietude in view of the unrest and revival of the old sentiment of opposition and prejudice to alien people which pervades certain of the Chinese provinces. As in the case of the attacks upon our citizens in Szechuan and at Kutien in 1895, the United States Minister has been instructed to secure the fullest measure of protection, both local and imperial, for any menaced American in this, and to demand in case of lawless injury to person or property instant reparation appropriate to the case. Warships have been stationed at Tien-Tsin for more ready observation of the disorders which have invaded even the Chinese capital, so as to be in a position to act should need arise, while a guard of marines has been sent to Peking to afford the Minister the same measure of authoritative protection as the representatives of other nations have been constrained to employ.

The Italy-Colombia Dispute, etc.—Following close upon the rendition of the award of my predecessor as arbitrator of the claim of the Italian subject Cerruti against the Republic of Colombia, differences arose between the parties to the arbitration in regard to the scope and extension of the award, of which certain articles were contested by Colombia, while Italy claimed their literal fulfillment. The award having been made by the President of the United States, as the act of friendly consideration and with the sole view to an impartial composition of the matter in dispute, I could not but feel deep concern at such a miscarriage, and, while unable to accept the Colombian theory that I, in my official capacity, possessed continuing functions as arbitrator, with power to interpret or revise the terms of the award, my best efforts were lent to bring the parties to a harmonious agreement as to the execution of its provisions. A naval demonstration by Italy resulted in an engagement to pay the liabilities claimed upon their ascertainment; but this apparent disposition of the controversy was followed by a rupture of diplomatic intercourse between Colombia and Italy, which still continues, although fortunately without acute symptoms having supervened. Notwithstanding this, efforts are reported to be continuing for the ascertainment of Colombia's contingent liability on account of Cerruti's debts, under the fifth article of the award.

A claim of an American citizen against the Dominican Republic for a public bridge over the Ozama River, which has been in diplomatic controversy for several years, has been settled by expert arbitration and an award in favor of the claimant amounting to about \$90,000. It, however, remains unpaid, despite urgent demands for its settlement according to the terms of the compact.

The Paris Exposition.—There is now every prospect that the participation of the United States in the universal exposition to be held in Paris in 1900 will be on a scale commensurate with the advanced position held by our products and industries in the

world's chief marts. The preliminary report of Mr. Moses P. Handy, who, under the act approved July 19, 1897, was appointed special commissioner, with a view to securing all attainable information necessary to a full and complete understanding by Congress in regard to the participation of this Government in the Paris Exposition, was laid before you by my message of December 6, 1897, and showed the large opportunities opened to make known our national progress in arts, science and manufactures, as well as the urgent need of immediate and adequate provision to enable due advantage thereof to be taken. Mr. Handy's death soon afterward rendered it necessary for another to take up and complete his unfinished work, and on January 11 last Mr. Thomas W. Cridler, Third Assistant Secretary of State, was designated to fulfill that task. His report was laid before you by my message of June 14, 1898, with the gratifying result of awakening renewed interest in the projected display. By a provision in the Sundry Civil Appropriation act of July 1, 1898, a sum not to exceed \$650,000 was allotted for the organization of a commission to care for the proper preparation and installation of American exhibits and for the display of suitable exhibits by the several executive departments, particularly by the Department of Agriculture, the Fish Commission, and the Smithsonian Institution, as representatives of the Government of the United States. Pursuant to that enactment I appointed Mr. Ferdinand W. Peck, of Chicago, Commissioner-General, with an Assistant Commissioner-General and Secretary. Mr. Peck at once proceeded to Paris, where his success in enlarging the scope and variety of the United States exhibit has been most gratifying. Notwithstanding the comparatively limited area of the exposition site—less than one-half that of the World's Fair at Chicago—the space assigned to the United States has been increased from the absolute allotment of 157,403 square feet, reported by Mr. Handy, to some 202,000 square feet, with corresponding augmentation of the field for a truly characteristic representation of the various important branches of our country's development. Mr. Peck's report will be laid before you. In my judgment its recommendations will call for your early consideration, especially as regards an increase of the appropriation to at least one million dollars in all, so that not only may the assigned space be fully taken up by the best possible exhibits in every class, but the preparation and installation be on so perfect a scale as to rank among the first in that unparalleled competition of artistic and inventive production, and thus counterbalance the disadvantage with which we start as compared with other countries whose appropriations are on a more generous scale, and whose preparations are in a state of much greater forwardness than our own. Where our artisans have the admitted capacity to excel, where our inventive genius has initiated many of the grandest discoveries of these later days of the century, and where the native resources of our land are as limitless as they are valuable to supply the world's needs, it is our province, as it should be our earnest care, to lead in the march of human progress and not rest content with any secondary place. Moreover, if this be due to ourselves, it is no less due to the great French nation whose guests we become, and which has in so many ways testified its wish and hope that our participation shall befit the place the two peoples have won in the field of universal development.

Promotion of Commercial Intercourse with France.—The commercial arrangements made with France on the 28th of May, 1898, under the provisions of Section 3 of the Tariff act of 1897 went into effect on the 1st day of June following. It has relieved a portion of our export trade from serious embarrassment. Further negotiations are now pending under Section 4 of the same act, with a view to the increase of trade between the two countries to their mutual advantage. Negotiations with other governments, in part interrupted by the war with Spain, are in progress under both sections of the Tariff act. I hope to be able to announce some of the results of these negotiations during the present session of Congress.

Germany and American Products.—Negotiations to the same end with Germany have been set on foot. Meanwhile no effort has been relaxed to convince the imperial Government of the thoroughness of our inspection of pork products for exportation, and it is trusted that the efficient administration of this measure by the Department of Agriculture will be recognized as a guarantee of the healthfulness of the food staples we send abroad to countries where their use is large and necessary. I transmitted to the Senate on the 10th of February last information touching the prohibition against the importation of fresh fruits from this country which had then recently been decreed by Germany on the ground of danger of disseminating the San José scale insect. This precautionary measure was justified by Germany on the score of the drastic steps taken in several States of the Union against the spread of the pest, the elaborate reports of the Department of Agriculture being put in evidence to show the danger to German fruit-growing interests should the scale obtain a lodgment in that country. Temporary relief was afforded in the case of

large consignments of fruit then on the way by inspection and admission when found non-infected. Later the prohibition was extended to dried fruits of every kind, but was relaxed so as to apply only to unpeeled fruit and fruit waste. As was to be expected, the alarm reached to other countries, and Switzerland has adopted a similar inhibition. Efforts are in progress to induce the German and Swiss governments to relax the prohibition in favor of dried fruits shown to have been cured under circumstances rendering the existence of animal life impossible.

Relations with Great Britain.—Our relations with Great Britain have continued on the most friendly footing. Assenting to our request, the protection of Americans and their interests in Spanish jurisdiction was assumed by the diplomatic and consular representatives of Great Britain, who fulfilled their delicate and arduous trust with tact and zeal, eliciting high commendation. I may be allowed to make fitting allusion to the instance of Mr. Ramsden, Her Majesty's Consul at Santiago de Cuba, whose untimely death after distinguished service and untiring effort during the siege of that city was sincerely lamented. In the early part of April last, pursuant to a request made at the instance of the Secretary of State by the British Ambassador at this capital, the Canadian Government granted facilities for the passage of four United States revenue cutters from the great lakes to the Atlantic coast by way of the Canadian canals and the St. Lawrence River. The vessels had reached Lake Ontario and were there awaiting the opening of navigation when war was declared between the United States and Spain. Her Majesty's Government thereupon, by a communication of the latter part of April, stated that the permission granted before the outbreak of hostilities would not be withdrawn provided the United States Government gave assurance that the vessels in question would proceed direct to a United States port without engaging in any hostile operation. This Government promptly agreed to the stipulated condition, it being understood that the vessels would not be prohibited from resisting any hostile attack. It will give me especial satisfaction if I shall be authorized to communicate to you a favorable conclusion of the pending negotiations with Great Britain in respect to the Dominion of Canada. It is the earnest wish of this Government to remove all sources of discord and irritation in our relations with the neighboring Dominion. The trade between the two countries is constantly increasing, and it is important to both countries that all reasonable facilities should be granted for its development.

Commercial Relations with Greece.—The Government of Greece strongly urges the onerousness of the duty here imposed upon the currants of that country, amounting to 100 per cent. or more of their market value. This fruit is stated to be exclusively a Greek product, not coming into competition with any domestic product. The question of reciprocal commercial relations with Greece, including the restoration of currants to the free list, is under consideration.

Haiti.—The long-standing claim of Bernard Campbell for damages for injuries sustained from a violent assault committed against him by military authorities in the island of Haiti has been settled by the agreement of that republic to pay him \$10,000 in American gold. Of this sum \$5,000 has already been paid. It is hoped that other pending claims of American citizens against that republic may be amicably adjusted.

Hawaii.—Pending the consideration by the Senate of the treaty signed June 16, 1897, by the plenipotentiaries of the United States and of the Republic of Hawaii, providing for the annexation of the islands, a joint resolution to accomplish the same purpose by accepting the offered cession and incorporating the ceded territory into the Union, was adopted by the Congress, and approved July 7, 1898. I thereupon directed the United States ship *Philadelphia* to convey Rear-Admiral Miller to Honolulu, and intrusted to his hands this important legislative act, to be delivered to the President of the Republic of Hawaii, with whom the Admiral and the United States Minister were authorized to make appropriate arrangements for transferring the sovereignty of the islands to the United States. This was simply but impressively accomplished on the 12th of August last, by the delivery of a certified copy of the resolution to President Dole, who thereupon yielded up to the representative of the Government of the United States the sovereignty and public property of the Hawaiian islands. Pursuant to the terms of the joint resolution, and in exercise of the authority thereby conferred upon me, I directed that the civil, judicial and military powers theretofore exercised by the officers of the Government of the Republic of Hawaii should continue to be exercised by those officers until Congress shall provide a government for the incorporated territory, subject to my power to remove such officers and to fill vacancies. The President, officers and troops of the republic thereupon took the oath of allegiance to the United States, thus providing for the uninterrupted continuance of all the administrative and municipal functions of the annexed territory until Congress shall otherwise enact. Following the further provision of the joint resolution, I appointed the Hons. Shelby M. Cullom, of Illinois; John T. Morgan, of Alabama; Robert R. Hitt, of Illinois; Sanford B. Dole, of Hawaii, and Walter F. Frear, of

Hawaii, as Commissioners to confer and recommend to Congress such legislation concerning the Hawaiian Islands as they should deem necessary or proper. The Commissioners having fulfilled the mission confided to them, their report will be laid before you at an early day. It is believed that their recommendations will have the earnest consideration due to the magnitude of the responsibility resting upon you to give such shape to the relationship of those mid-Pacific lands to our home Union as will benefit both in the highest degree, realizing the aspirations of the community that has cast its lot with us and elected to share our political heritage, while at the same time justifying the foresight of those who for three-quarters of a century have looked to the assimilation of Hawaii as a natural and inevitable consummation, in harmony with our needs and in fulfillment of our cherished traditions.

The questions heretofore pending between Hawaii and Japan, growing out of the alleged mistreatment of Japanese treaty immigrants, were, I am pleased to say, adjusted before the act of transfer, by the payment of a reasonable indemnity to the Government of Japan. Under the provisions of the joint resolution the existing customs relations of the Hawaiian islands with the United States and with other countries remain unchanged until legislation shall otherwise provide. The Consuls of Hawaii, here and in foreign countries, continue to fulfill their commercial agencies, while the United States Consulate at Honolulu is maintained for all appropriate services pertaining to trade and the revenue. It would be desirable that all foreign Consuls in the Hawaiian Islands should receive new exequaturs from this Government. The attention of Congress is called to the fact that our Consular officers having ceased to exist in Hawaii, and being about to cease in other countries coming under the sovereignty of the United States, the provisions for the relief and transportation of destitute American seamen in these countries under our Consular regulations will in consequence terminate. It is proper, therefore, that new legislation should be enacted upon this subject, in order to meet the changed conditions.

Relations with Mexico.—The interpretation of certain provisions of the extradition convention of December 11, 1861, has been at various times the occasion of controversy with the Government of Mexico. An acute difference arose in the case of the Mexican demand for the delivery of Jesus Guerra, who, having led a marauding expedition near the border with the proclaimed purpose of initiating an insurrection against President Diaz, escaped into Texas. Extradition was refused on the ground that the alleged offense was political in its character, and therefore came within the treaty proviso of non-surrender. The Mexican contention was that the exception only related to purely political offenses, and that as Guerra's acts were admixed with the common crimes of murder, arson, kidnapping and robbery, the option of non-delivery became void, a position which this Government was unable to admit in view of the received international doctrine and practice in the matter. The Mexican Government, in view of this, gave notice January 24, 1898, of the termination of the convention, to take effect twelve months from that date, at the same time inviting the conclusion of a new convention, toward which negotiations are on foot. In this relation I may refer to the necessity of some amendment of our existing extradition statute. It is a common stipulation of such treaties that neither party shall be bound to give up its own citizens with the added proviso in one of our treaties, that with Japan, that it may surrender if it see fit. It is held in this country by an almost uniform course of decisions that where a treaty negatives the obligation to surrender the President is not invested with legal authority to act. The conferment of such authority would be in the line of that sound morality which shrinks from affording secure asylum to the author of a heinous crime. Again, statutory provision might well be made for what is styled extradition by way of transit, whereby a fugitive surrendered by one foreign government to another may be conveyed across the territory of the United States to the jurisdiction of the demanding State. A recommendation in this behalf, made in the President's message of 1886, was not acted upon. The matter is presented for your consideration. The problem of the Mexican free zone has been often discussed with regard to its inconvenience as a provocative of smuggling into the United States along an extensive and thinly guarded land border. The effort made by the joint resolution of March 1, 1895, to remedy the abuse charged by suspending the privilege of free transportation in bond across the territory of the United States to Mexico failed of good result, as is stated in report No. 702 of the House of Representatives, submitted in the last session, March 11, 1898. As the question is one to be conveniently met by wise concurrent legislation of the two countries, looking to the protection of the revenues by harmonious measures operating equally on either side of the boundary, rather than by conventional arrangements, I suggest that Congress consider the advisability of authorizing and inviting a conference of representatives of the Treasury Departments of the United States and Mexico to consider the subject in all its complex bearings, and make report, with pertinent recommendations,

to the respective governments for the information and consideration of their Congresses. The Mexican War Boundary Commission has adjusted all matters submitted to it to the satisfaction of both governments save in three important cases; that of the "Chamisal," at El Paso, Tex., where the two Commissioners failed to agree, and wherein, for this case only, this Government has proposed to Mexico the addition of a third member; the proposed elimination of what are known as "Bancos," small, isolated islands formed by the cutting off of bends in the Rio Grande, from the operation of the treaties of 1884 and 1889, recommended by the Commissioners and approved by this Government, but still under consideration by Mexico; and the subject of the "equitable distribution of the waters of the Rio Grande," for which the Commissioners recommended an international dam and reservoir, approved by Mexico, but still under consideration by this Government. Pending these questions it is necessary to extend the life of the Commission, which expires December 23 next.

The coronation of the young Queen of the Netherlands was made the occasion of fitting congratulations.

Relations with Peru.—The claim of Victor H. McCord against Peru, which for a number of years has been pressed by this Government and has on several occasions attracted the attention of the Congress, has been satisfactorily adjusted. A protocol was signed May 17, 1898, whereby, the fact of liability being admitted, the question of the amount to be awarded was submitted to the Chief Justice of Canada as sole arbitrator. His award sets the indemnity due the claimant at \$40,000. The Government of Peru has given the prescribed notification of its intention to abrogate the treaty of friendship, commerce and navigation, concluded with this country August 31, 1887. As that treaty contains many important provisions necessary to the maintenance of commerce and good relations, which could with difficulty be replaced by the negotiation of renewed provisions within the brief twelve months intervening before the treaty terminates, I have invited suggestions by Peru as to the particular provisions it is desired to annul, in the hope of reaching an arrangement whereby the remaining articles may be provisionally saved.

Russia.—His Majesty the Czar having announced his purpose to raise the Imperial Russian mission at this capital to the rank of an embassy. I responded, under the authority conferred by the Act of March 3, 1893, by commissioning and accrediting the actual representative at St. Petersburg in the capacity of Ambassador Extraordinary and Minister Plenipotentiary. The Russian Ambassador to this country has since presented his credentials. The proposal of the Czar for a general reduction of the vast military establishments that weigh so heavily upon many peoples in time of peace was communicated to this Government, with an earnest invitation to be represented in the conference which it is contemplated to assemble with a view to discussing the means of accomplishing so desirable a result. His Majesty was at once informed of the cordial sympathy of this Government with the principle involved in his exalted proposal, and of the readiness of the United States to take part in the conference. The active military force of the United States, as measured by our population, territorial area and taxable wealth, is, and under any conceivable prospective conditions must continue to be, in time of peace, so conspicuously less than that of the armed powers to whom the Czar's appeal is especially addressed, that the question can have for us no practical importance save as marking an auspicious step toward the betterment and good-will among them; but in this view it behooves us as a nation to lend countenance and aid to the beneficent project. The claims of owners of American sealing vessels for seizure by Russian cruisers in Behring Sea are being pressed to a settlement. The equities of the cases justify the expectation that a measure of reparation will eventually be accorded in harmony with precedent and in the light of the proved facts. The recommendation made in my special message of April 27 last is renewed, that appropriation be made to reimburse the master and owners of the Russian bark *Hans* for wrongful arrest of the master and detention of the vessel in February, 1896, by officers of the United States District Court for the Southern District of Mississippi. The papers accompanying my said message make out a most meritorious claim and justify the urgency with which it has been presented by the Government of Russia.

Affairs in Samoa.—Malietoa Laupepa, King of Samoa, died on August 22 last. According to Article I. of the General Act of Berlin, "His successor shall be duly elected according to the laws and customs of Samoa." Arrangements having been agreed upon between the signatories of the General Act for the return of Mataafa and the other exiled Samoan chiefs, they were brought from Jaluit by a German war vessel and landed at Apia on September 18 last. Whether the death of Malietoa and the return of his old-time rival Mataafa will add to the undesirable complications which the execution of the tripartite General Act has heretofore developed remains to be seen. The efforts of this Government will, as heretofore, be addressed toward a harmonious and exact fulfillment of the terms of the international engagement to which the United States became a party in 1889.

Relations with Siam.—The Cheek claim against Siam, after some five years of controversy, has been adjusted by arbitration, under an agreement signed July 6, 1897, an award of 706,721 ticals (about \$187,987.78), with release of the Cheek estate from mortgage claims, having been rendered March 21, 1898, in favor of the claimant by the arbitrator, Sir Nicholas John Hannen, British Chief Justice for China and Japan. An envoy from Siam has been accredited to this Government and has presented his credentials.

Relation of the Government to the Red Cross Work.—Immediately upon the outbreak of the war with Spain the Swiss Government, fulfilling the high mission it has deservedly assumed as the patron of the International Red Cross, proposed to the United States and Spain that they should severally recognize and carry into execution, as a *modus vivendi*, during the continuance of hostilities, the additional articles proposed by the international conference of Geneva, October 20, 1868, extending the effects of the existing Red Cross convention of 1864 to the conduct of naval war. Following the example set by France and Germany in 1870 in adopting such a *modus vivendi*, and in view of the accession of the United States to those additional articles in 1882, although the exchange of ratifications thereof still remains uneffected, the Swiss proposal was promptly and cordially accepted by us, and simultaneously by Spain. This Government feels a keen satisfaction in having thus been enabled to testify its adherence to the broadest principles of humanity even amid the clash of war, and it is to be hoped that the extension of the Red Cross compact to hostilities by sea as well as on land may soon become an accomplished fact through the general promulgation of the additional naval Red Cross articles by the maritime powers now parties to the convention of 1864.

The important question of the claim of Switzerland to the perpetual Cantonal allegiance of American citizens of Swiss origin has not made hopeful progress toward a solution, and controversies in this regard still continue.

Turkey.—The newly accredited envoy of the United States to the Ottoman Porte carries instructions looking to the disposal of matters in controversy with Turkey for a number of years. He is especially charged to press for a just settlement of our claims for indemnity by reason of the destruction of the property of American missionaries resident in that country during the Armenian troubles of 1895, as well as for the recognition of older claims of equal justness. He is also instructed to seek an adjustment of the dispute growing out of the refusal of Turkey to recognize the acquired citizenship of Ottoman-born persons naturalized in the United States since 1869 without prior imperial consent; and in the same general relation he is directed to endeavor to bring about a solution of the question which has more or less acutely existed since 1869 concerning the jurisdictional rights of the United States in matters of criminal procedure and punishment under Article IV. of the treaty of 1830. This latter difficulty grows out of a verbal difference, claimed by Turkey to be essential, between the original Turkish text and the promulgated translation. After more than two years from the appointment of a consul of this country to Erzeroum, he has received his exequatur.

The Venezuelan Boundary.—The arbitral tribunal appointed under the treaty of February 2, 1897, between Great Britain and Venezuela to determine the boundary line between the latter and the colony of British Guiana is to convene at Paris during the present month. It is a source of much gratification to this Government to see the friendly resort of arbitration applied to the settlement of this controversy, not alone because of the earnest part we have had in bringing about the result, but also because the two members named on behalf of Venezuela, Mr. Chief Justice Fuller and Mr. Justice Brewer, chosen from our highest court, appropriately testify the continuing interest we feel in the definitive adjustment of the question according to the strictest rules of justice. The British members, Lord Herschell and Sir Richard Collins, are jurists of no less exalted repute, while the fifth member and president of the tribunal, M. F. De Martens, has earned a world-wide reputation as an authority upon international law.

The claim of Felipe Scandella against Venezuela for arbitrary expulsion and injury to his business has been adjusted by the revocation of the order of expulsion and by the payment of the sum of \$16,000.

The Collection of Commercial Statistics.—I have the satisfaction of being able to state that the Bureau of the American Republics, created in 1890 as the organ for promoting commercial intercourse and fraternal relations among the countries of the Western Hemisphere, has become a more efficient instrument of the wise purposes of its founders, and is receiving the cordial support of the contributing members of the international union which are actually represented in its board of management. A commercial directory, in two volumes, containing a mass of statistical matter descriptive of the industrial and commercial interests of the various countries, has been printed in English, Spanish, Portuguese and French, and a monthly bulletin published in these four languages and distributed in the Latin-American coun-

tries as well as in the United States, has proved to be a valuable medium for disseminating information and furthering the varied interests of the international union. During the past year the important work of collecting information of practical benefit to American industries and trade through the agency of diplomatic and Consular officers has been steadily advanced, and in order to lay such data before the public with the least delay the practice was begun in January, 1898, of issuing the commercial reports from day to day as they are received by the Department of State. It is believed that for promptitude as well as fullness of information the service thus supplied to our merchants and manufacturers will be found to show sensible improvement and to merit the liberal support of Congress.

The Financial Condition of the Country.—The experiences of the last year bring forcibly home to us a sense of the burdens and the waste of war. We desire, in common with most civilized nations, to reduce to the lowest possible point the damage sustained in time of war by peaceful trade and commerce. It is true, we may suffer in such cases less than other communities, but all nations are damaged more or less by the state of uneasiness and apprehension into which an outbreak of hostilities throws the entire commercial world. It should be our object, therefore, to minimize so far as practicable this inevitable loss and disturbance. This purpose can probably best be accomplished by an international agreement to regard all private property at sea as exempt from capture or destruction by the forces of belligerent powers. The United States Government has for many years advocated this humane and beneficent principle, and is now in position to recommend it to other powers without the imputation of selfish motives. I therefore suggest for your consideration that the Executive be authorized to correspond with the governments of the principal maritime powers with a view of incorporating into the permanent law of civilized nations the principle of the exemption of all private property at sea, not contraband of war, from capture or destruction by belligerent powers.

The Secretary of the Treasury reports that the receipts of the Government from all sources during the fiscal year ended June 30, 1898, including \$64,751,223 received from the sale of Pacific railroads, amounted to \$405,321,335, and its expenditures to \$443,368,582. There was collected from customs \$149,575,062, and from internal revenue, \$170,900,641. Our dutiable imports amounted to \$324,635,479, a decrease of \$58,156,690 over the preceding year, and importations free of duty amounted to \$291,414,175, a decrease from the preceding year of \$90,524,068. Internal revenue receipts exceeded those of the preceding year by \$24,212,067. The total tax collected on distilled spirits was \$92,546,999; on manufactured tobacco, \$36,230,522, and on fermented liquors, \$39,515,421. We exported merchandise during the year amounting to \$1,231,482,330, an increase of \$180,488,774 from the preceding year.

It is estimated upon the basis of present revenue laws that the receipts of the Government for the year ending June 30, 1899, will be \$577,874,647, and its expenditures, \$689,874,647, resulting in a deficiency of \$112,000,000. On the 1st of December, 1898, there was held in the Treasury gold coin amounting to \$138,441,547, gold bullion amounting to \$138,502,545, silver bullion amounting to \$93,359,250, and other forms of money amounting to \$451,963,981. On the same date the amount of money of all kinds in circulation or not included in Treasury holdings was \$1,886,879,504, an increase for the year of \$165,794,966. Estimating our population at 75,194,000 at the time mentioned the per capita circulation was \$25.09. On the same date there was in the Treasury gold bullion amounting to \$138,502,545. The provisions made for strengthening the resources of the Treasury in connection with the war has given increased confidence in the purpose and power of the Government to maintain the present standard, and has established more firmly than ever the national credit at home and abroad. A marked evidence of this is found in the inflow of gold to the Treasury. Its net gold holdings on November 1, 1898, were \$239,885,162, as compared with \$153,573,147 on November 1, 1897, to \$300,238,275 November 1, 1898. The present ratio of net Treasury gold to outstanding Government liabilities, including United States notes, Treasury notes of 1890, silver certificates, currency certificates, standard silver dollars, and fractional silver coin November 1, 1898, was 25.35 per cent., as compared with 16.96 per cent. November 1, 1897.

Currency Reform.—I renew so much of my recommendation of December, 1897, as follows: That when any of the United States notes are presented for redemption in gold and are redeemed in gold such notes shall be kept and set apart and only paid out in exchange for gold. This is an obvious duty. If the holder of the United States note prefers the gold and gets it from the Government he should not receive back from the Government a United States note without paying gold in exchange for it. The reason for this is made all the more apparent when the Government issues an interest-bearing debt to provide gold for the redemption of

United States notes—a non-interest-bearing debt. Surely it should not pay them out again except on demand, and for gold. If they are put out in any other way, they may return again to be followed by another bond issue to redeem—another interest-bearing debt to redeem a non-interest-bearing debt. This recommendation was made in the belief that such provisions of law would insure to a greater degree the safety of the present standard, and better protect our currency from the dangers to which it is subjected from a disturbance in the general business conditions of the country. In my judgment the present condition of the Treasury amply justifies the immediate enactment of the legislation recommended one year ago, under which a portion of the gold holdings should be placed in a trust fund from which greenbacks should be redeemed upon presentation, but when once redeemed should not thereafter be paid out except for gold. It is not to be inferred that other legislation relating to our currency is not required; on the contrary, there is an obvious demand for it. The importance of adequate provision which will insure to our future a money standard, related as our money standard now is to that of our commercial rivals, is generally recognized. The companion proposition that our domestic paper currency shall be kept safe and yet be so related to the needs of our industries and internal commerce as to be adequate and responsive to such needs is a proposition scarcely less important. The subject, in all its parts, is commended to the wise consideration of the Congress.

New Colonial Possessions.—The annexation of Hawaii and the changed relations of the United States to Cuba, Porto Rico and the Philippines, resulting from the war, compel the prompt adoption of a maritime policy by the United States. There should be established regular and frequent steamship communication, encouraged by the United States, under the American flag, with the newly acquired islands. Spain furnished to its colonies, at an annual cost of about \$2,000,000, steamship lines communicating with a portion of the world's markets as well as with trade centres of the home Government. The United States will not undertake to do less. It is our duty to furnish the people of Hawaii with facilities, under national control, for their export and import trade. It will be conceded that the present situation calls for legislation which shall be prompt, durable and liberal. The part which American merchant vessels and their seamen performed in the war with Spain demonstrates that this service, furnishing both pickets and the second line of defense, is a national necessity and should be encouraged in every Constitutional way. Details and methods for the accomplishment of this purpose are discussed in the report of the Secretary of the Treasury to which the attention of Congress is respectfully invited. In my last annual message I recommended that Congress authorize the appointment of a commission for the purpose of making systematic investigations with reference to the cause and prevention of yellow fever. This matter has acquired an increased importance as a result of the military occupation of the island of Cuba and the commercial intercourse between this island and the United States, which we have every reason to expect. The sanitary problems connected with our new relations with the island of Cuba and the acquisition of Porto Rico are no less important than those relating to finance, commerce and administration. It is my earnest desire that these problems may be considered by competent experts, and that everything may be done which the most recent advances in sanitary science can offer for the protection of the health of our soldiers in those islands, and of our citizens who are exposed to the dangers of infection from the importation of yellow fever. I therefore renew my recommendation that the authority of Congress may be given, and a suitable appropriation made, to provide for a commission of experts to be appointed for the purpose indicated.

The Army.—Under the act of Congress approved April 26, 1898, authorizing the President, in his discretion, "under a declaration of war by Congress, or a declaration by Congress that war exists," I directed the increase of the regular army to the maximum of 62,000, authorized in said act. There are now in the regular army 57,862 officers and men. In said act it was provided "that at the end of any war in which the United States may become involved the army shall be reduced to a peace basis by the transfer in the same arm of the service or absorption by promotion or honorable discharge, under such regulations as the Secretary of War may establish, of supernumerary commissioned officers and the honorable discharge or transfer of supernumerary enlisted men; and nothing contained in this act shall be construed as authorizing the permanent increase of the commissioned or enlisted force of the regular army beyond that now provided by the law in force prior to the passage of this act, except as to the increase of twenty-five Majors provided for in Section 1 hereof." The importance of legislation for the permanent increase of the army is therefore manifest, and the recommendation of the Secretary of War for the purpose has my unqualified approval. There can be no question that at this time, and probably for some time in the future, 100,000 men will be none too many to meet the necessities of the situation. At all events, whether that number shall be required permanently

or not, the power should be given to the President to enlist that force if in his discretion it should be necessary; and the further direction should be given him to recruit for the army within the above limit from the inhabitants of the islands with the government of which we are charged. It is my purpose to muster out the entire volunteer army as soon as the Congress shall provide for the increase of the regular establishment. This will be only an act of justice, and will be much appreciated by the brave men who left their homes and employments to help the country in its emergency.

Government Railway Interests.—In my last annual message I stated: "The Union Pacific Railway, main line, was sold, under the decree of the United States Court for the District of Nebraska, on the 1st and 2d of November of this year. The amount due the Government consisted of the principal of the subsidy bonds, \$27,236,512, and the accrued interest thereon, \$31,211,711.75, making the total indebtedness \$58,448,223.75. The bid at the sale covered the first mortgage lien and the entire mortgage claim of the Government, principal and interest." This left the Kansas Pacific case unincorporated. By a decree of the court in that case, an upset price for the property was fixed at a sum which would yield to the Government only \$2,500,000 upon its lien. The sale, at the instance of the Government, was postponed, first to December 15, 1897, and later, upon the application of the United States, was postponed to the 16th day of February, 1898. Having satisfied myself that the interests of the Government required that an effort should be made to obtain a large sum, I directed the Secretary of the Treasury, under the act passed March 3, 1887, to pay out of the Treasury to the persons entitled to receive the same, the amounts due upon all prior mortgages upon the eastern and middle divisions of said railroad out of any money in the Treasury not otherwise appropriated. Whereupon the Attorney-General prepared a petition to be presented to the court, offering to redeem said prior liens in such manner as the court might direct, and praying that thereupon the United States might be held to be subrogated to all the rights of said prior lien holders and that a receiver might be appointed to take possession of the mortgaged premises and maintain and operate the same until the court or Congress otherwise directed. Thereupon the Reorganization Committee agreed that, if said petition was withdrawn and the sale allowed to proceed on the 16th of February, 1898, it would bid a sum at the sale which would realize to the Government the entire principal of its debt, \$6,303,000. Believing that no better price could be obtained, and appreciating the difficulties under which the Government would labor if it should become the purchaser of the road at the sale, in the absence of any authority by Congress to take charge of and operate the road, I directed that upon the guaranty of a minimum bid which should give the Government the principal of its debt, the sale should proceed. By this transaction the Government secured an advance of \$3,803,000 over and above the sum which the court had fixed as the upset price and which the Reorganization Committee had declared was the maximum that they would pay for the property. It is a gratifying fact that the result of these proceedings against the Union Pacific system and the Kansas Pacific Line is that the Government has received on account of its subsidy claim the sum of \$64,751,223.75, an increase of \$18,997,163.76 over the sum which the Reorganization Committee originally agreed to bid for the joint property, the Government receiving its whole claim, principal and interest, on the Union Pacific, and the principal of its debt on the Kansas Pacific Railroad. Steps had been taken to foreclose the Government's lien upon the Central Pacific Railroad Company, but before action was commenced Congress passed an act, approved July 7, 1898, creating a commission consisting of the Secretary of the Treasury, the Attorney-General, and the Secretary of the Interior and their successors in office, with full power to settle the indebtedness to the Government growing out of the issue of bonds in aid of the construction of the Central Pacific and Western Pacific bond-aided railroads, subject to the approval of the President. No report has yet been made to me by the commission thus created. Whatever action is had looking to a settlement of the indebtedness in accordance with the act referred to will be duly submitted to Congress.

Recommendations for New Government Buildings.—I deem it my duty to call to the attention of Congress the condition of the present building occupied by the Department of Justice. The business of that department has increased very greatly since it was established in its present quarters. The building now occupied by it is neither large enough nor of suitable form for the proper accommodation of the business of the department. The supervising architect has pronounced it unsafe and unsuited for the use to which it is put. The Attorney-General in his report states that the library of the department is upon the fourth floor, and that all the space allotted to it is so crowded with books as to dangerously overload the structure. The first floor is occupied by the Court of Claims. The building is of an old and dilapidated appearance, unsuited to the dignity which should attach to this important department.

A proper regard for the safety, comfort and convenience of the officers and employés would justify the expenditure of a liberal sum of money in the erection of a new building of commodious proportions and handsome appearance upon the very advantageous site already secured for that purpose, including the ground occupied by the present structure and adjoining vacant lot, comprising in all a frontage of 201 feet on Pennsylvania Avenue and a depth of 136 feet. In this connection I may likewise refer to the inadequate accommodations provided for the Supreme Court in the Capitol and suggest the wisdom of making provision for the erection of a separate building for the court and its officers and library upon available grounds near the Capitol.

The Postal Service.—The Postal Service of the country advances with extraordinary growth. Within twenty years both the revenues and the expenditures of the Post Office Department have multiplied threefold. In the last ten years they have nearly doubled. Our postal business grows much more rapidly than our population. It now involves an expenditure of \$100,000,000 a year, numbers 73,000 post offices, and enrolls 200,000 employés. This remarkable extension of a service which is an accurate index of the public conditions presents gratifying evidences of the advancement of education, of the increase of communication and business activity, and of the improvement of mail facilities, leading to their constantly augmenting use. The war with Spain laid new and exceptional labors on the Post Office Department. The mustering of the military and naval forces of the United States required special mail arrangements for every camp and every campaign. The communication between home and camp was naturally eager and expectant. In some of the larger places of rendezvous as many as 50,000 letters a day required handling. This necessity was met by the prompt detail and dispatch of experienced men from the established forces by directing all the instrumentalities of the Railway Mail and Post Office Service, so far as necessary to this new need. Congress passed an act empowering the Postmaster-General to establish offices or branches at every military camp or station, and under this authority the postal machinery was speedily put into effective operation. Under the same authority, when our forces moved upon Cuba, Porto Rico and the Philippines, they were attended and followed by the Postal Service. Though the act of Congress authorized the appointment of postmasters where necessary, it was early determined that the public interests would best be subserved, not by new designations, but by the detail of experienced men familiar with every branch of the service, and this policy was steadily followed. When the territory which was the theatre of conflict came into our possession, it became necessary to re-establish mail facilities for the resident population, as well as to provide them for our forces of occupation, and the former requirement was met through the extension and application of the latter obligation. I gave the requisite authority, and the same general principle was applied to this as to other branches of civil administration under military occupation. The details are more particularly given in the report of the Postmaster-General, and, while the work is only just begun, it is pleasing to be able to say that the service which has come under our control is already materially improved.

The Navy.—The following recommendations of the Secretary of the Navy relative to the increase of the navy have my earnest approval:

1. Three sea-going sheathed and coppered battleships of about 13,500 tons trial displacement, carrying the heaviest armor and most powerful ordnance for vessels of their class, and to have the highest practicable speed and great radius of action. Estimated cost, exclusive of armor and armament, \$3,600,000 each.

2. Three sheathed and coppered armored cruisers of about 12,000 tons trial displacement, carrying the heaviest armor and most powerful ordnance for vessels of their class and to have the highest practicable speed and great radius of action. Estimated cost, exclusive of armor and armament, \$4,000,000 each.

3. Three sheathed and coppered protected cruisers of about 6,000 tons trial displacement, to have the highest possible speed and great radius of action, and to carry the most powerful ordnance suitable for vessels of their class. Estimated cost, exclusive of armor and armament, \$2,150,000 each.

4. Six sheathed and coppered cruisers of about 2,500 tons trial displacement, to have the highest speed compatible with good cruising qualities, great radius of action, and to carry the most powerful ordnance suited to vessels of their class. Estimated cost, exclusive of armament, \$1,141,800 each.

I join with the Secretary of the Navy in recommending that the grades of Admiral and Vice-Admiral be temporarily revived, to be filled by officers who have specially distinguished themselves in the war with Spain.

The Census of 1900.—I earnestly urge upon Congress the importance of early legislation providing for the taking of the twelfth census. This is necessary in view of the large amount of work which must be performed in the preparation of the schedules preparatory to the enumeration of the population.

Pension and Patent Statistics.—There were on the pension rolls on June 30,

1898, 993,714 names, an increase of nearly 18,000 over the number on the rolls on the same day of the preceding year. The amount appropriated by the act of December 22, 1896, for the payment of pensions for the fiscal year of 1898 was \$140,000,000. Eight million seventy thousand eight hundred and seventy-two dollars and forty-six cents was appropriated by the act of March 31, 1898, to cover deficiencies in army pensions, and repayments in the sum of \$12,020.33, making a total of \$148,082,892.79 available for the payment of pensions during the fiscal year 1898. The amount disbursed from that sum was \$144,651,879.80, leaving a balance of \$3,431,012.99 unexpended on the 30th of June, 1898, which was covered into the Treasury. There were 389 names added to the rolls during the year by special acts passed at the second session of the Fifty-fifth Congress, making a total of 6,486 pensioners by Congressional enactments since 1861. The total receipts of the Patent Office during the past year were \$1,253,948.44. The expenditures were \$1,081,633.79, leaving a surplus of \$172,314.65.

The Interior Department.—The public lands disposed of by the Government during the year reached 8,453,896.92 acres, an increase of 614,780.26 acres over the previous year. The total receipts from public lands during the fiscal year amounted to \$2,277,995.18, an increase of \$190,063.90 over the preceding year. The lands embraced in the eleven forest reservations, which were suspended by the act of June 4, 1897, again became subject to the operations of the proclamations of February 22, 1897, creating them, which added an estimated amount of 19,951,360 acres to the area embraced in the reserves previously created. In addition thereto, two new reserves were created during the year, the Pine Mountain and Zaca Lake Reserve, in California, embracing 1,644,594 acres, and the Prescott Reserve, in Arizona, embracing 10,240 acres, while the Pecos River Reserve, in New Mexico, has been changed and enlarged to include 120,000 additional acres.

At the close of the year thirty forest reservations, not including those of the Afognac Forest and the fish-culture reserve in Alaska, had been created by Executive proclamations under Section 24 of the act of March 3, 1891, embracing an estimated area of 40,719.474 acres. The Department of the Interior has inaugurated a forest system, made possible by the act of July, 1898, for a graded force of officers in control of the reserves. This system has only been in full operation since August, but good results have already been secured in many sections. The reports received indicate that the system of patrol has not only prevented destructive fires from gaining headway, but has diminished the number of fires. The special attention of the Congress is called to the part of the report of the Secretary of the Interior in relation to the five civilized tribes. It is noteworthy that the general condition of the Indians shows marked improvement. But one outbreak of a serious character occurred during the year, and that among the Chippewa Indians of Minnesota, which, happily, has been suppressed. While it has not yet been practicable to enforce all the provisions of the act of June 28, 1898, "for the protection of the people of the Indian Territory, and for other purposes," it is having a salutary effect upon the nations composing the five tribes. The Dawes Commission reports that the most gratifying results and greater advance toward the attainment of the objects of the Government have been secured in the past year than in any previous year. I cannot too strongly indorse the recommendation of the Commission and of the Secretary of the Interior for the necessity of providing for the education of the 30,000 white children resident in the Indian Territory.

Other Departments, etc.—The Department of Agriculture has been active in the past year. Explorers have been sent to many of the countries of the Eastern and Western Hemispheres for seeds and plants that may be useful to the United States, and with the further view of opening up markets for our surplus products. The Forestry Division of the department is giving special attention to the treeless regions of our country, and is introducing species specially adapted to semi-arid regions. Forest fires, which seriously interfere with production, especially in irrigated regions, are being studied that losses from this cause may be avoided. The department is inquiring into the use and abuse of water in many States of the West, and collecting information regarding the laws of the States, the decisions of the courts, and the customs of the people in this regard, so that uniformity may be secured. Experiment stations are becoming more effective every year. The annual appropriation of \$720,000 by Congress is supplemented by \$400,000 from the States. Nation-wide experiments have been conducted to ascertain the suitability as to soil and climate and States for growing beets. The number of sugar factories has been doubled in the past two years, and the ability of the United States to produce its own sugar from this source has been clearly demonstrated.

The Weather Bureau forecast and observation stations have been extended around the Caribbean Sea to give early warning of the approach of hurricanes from the South Seas to our fleets and merchant marine.

In the year 1900 will occur the centennial anniversary of the founding of the city of Washington for the permanent capital of the Government of the United States by authority of an act of Congress approved July 16, 1790. In May, 1800, the archives and general offices of the Federal Government were removed to this place. On the 17th of November, 1800, the National Congress met here for the first time, and assumed exclusive control of the Federal district and city. This interesting event assumes all the more significance when we recall the circumstances attending the choosing of the site, the naming of the capital in honor of the Father of His Country, and the interest taken by him in the adoption of plans for its future development on a magnificent scale. These original plans have been wrought out with a constant progress and a signal success, even beyond anything their framers could have foreseen. The people of the country are justly proud of the distinctive beauty and government of the capital and of the rare instruments of science and education which here found their natural home. A movement lately inaugurated by the citizens to have the anniversary celebrated with fitting ceremonies, including, perhaps, the establishment of a handsome permanent memorial to mark so historical an occasion, and to give it more than local recognition, has met with general favor on the part of the public. I recommend to the Congress the granting of an appropriation for this purpose and the appointment of a committee from its respective bodies. It might also be advisable to authorize the President to appoint a committee from the country at large, which, acting with the Congressional and District of Columbia Committees, can complete the plans for an appropriate National celebration.

The alien contract-labor law is showing by experience to need some amendment. A measure providing better protection for seamen is proposed; the rightful application of the eight-hour law for the benefit of labor and of the principle of arbitration is suggested for consideration, and I commend these subjects to the careful attention of the Congress. The several departmental reports will be laid before you. They give in great detail the conduct of the affairs of the Government during the past year, and discuss many questions upon which the Congress may feel called upon to act.

EXECUTIVE MANSION, December 5, 1898.

WILLIAM MCKINLEY.

TREATY BETWEEN THE UNITED STATES AND SPAIN.

(Signed in Paris, December 10, 1898.)

The United States of America and Her Majesty the Queen Regent of Spain, in the name of her august son, Don Alfonso XIII., desiring to end the state of war now existing between the two countries, have for that purpose appointed as plenipotentiaries:

The President of the United States: WILLIAM R. DAY, CUSHMAN K. DAVIS, WILLIAM P. FRYE, GEORGE GRAY, and WHITELAW REID, citizens of the United States. And Her Majesty the Queen Regent of Spain: Don EUGENIO MONTERO RIOS, President of the Senate; Don BUENAVENTURA DE ABARZUZA, Senator of the Kingdom and ex-Minister of the Crown; Don JOSÉ DE GARNICA, Deputy to the Cortes and Associate Justice of the Supreme Court; Don WENCESLAO RAMIREZ DE VILLA URRUTIA, Envoy Extraordinary and Minister Plenipotentiary at Brussels, and Don RAFAEL CERERO, General of Division.

Who, having assembled in Paris, and having exchanged their full powers, which were found to be in due and proper form, have, after discussion of the matters before them, agreed upon the following articles:

ARTICLE 1.—Spain relinquishes all claim of sovereignty over and title to Cuba.

And as the island is, upon its evacuation by Spain, to be occupied by the United States, the United States will, so long as such occupation shall last, assume and discharge the obligations that may under international law result from the fact of its occupation for the protection of life and property.

ARTICLE 2.—Spain cedes to the United States the island of Porto Rico and other islands now under Spanish sovereignty in the West Indies, and the island of Guam, in the Marianas or Ladrones.

ARTICLE 3.—Spain cedes to the United States the archipelago known as the Philippine Islands, and comprehending the islands lying within the following lines:

A line running from west to east along or near the twentieth parallel of north latitude, and through the middle of the navigable channel of Bachtí, from the 118th to the 127th degree meridian of longitude east of Greenwich, thence along the 127th degree meridian of longitude east of Greenwich to the parallel of 4° 45' north latitude, thence along the parallel of 4° 45' north latitude to its intersection with the meridian of longitude 119° 35' east of Greenwich, thence along the meridian of longitude 119° 35' east of Greenwich to the parallel of latitude 7° 40' north, thence along the parallel of latitude 7° 40' north to its intersection with the 116th degree meridian of longitude east of Greenwich, thence by a direct line to the intersection of the 10th degree parallel of north latitude with the 118th degree meridian of longitude east of Greenwich, and thence along the 118th degree meridian of longitude east of Greenwich to the point of beginning.

The United States will pay to Spain the sum of \$20,000,000 within three months after the exchange of the ratifications of the present treaty.

ARTICLE 4.—The United States will, for ten years from the date of exchange of ratifications of the present treaty, admit Spanish ships and merchandise to the ports of the Philippine Islands on the same terms as ships and merchandise of the United States.

ARTICLE 5.—The United States will, upon the signature of the present treaty, send back to Spain at its own cost the Spanish soldiers taken as prisoners of war on the capture of Manila by the American forces. The arms of the soldiers in question shall be restored to them.

Spain will, upon the exchange of the ratifications of the present treaty, proceed to evacuate the Philippines, as well as the island of Guam, on terms similar to those agreed upon by the commissioners appointed to arrange for the evacuation of Porto Rico and other islands in the West Indies under the protocol of August 12, 1898, which is to continue in force till its provisions are completely executed.

The time within which the evacuation of the Philippine Islands and Guam shall be completed shall be fixed by the two governments. Stands of colors, uncaptured war vessels, small arms, guns of all calibres, with their carriages and accessories, powder, ammunition, live stock, and materials and supplies of all kinds belonging to the land and naval forces of Spain in the Philippines and Guam remain the property of Spain. Pieces of heavy ordnance, exclusive of field artillery, in the fortifications and coast defenses shall remain in their emplacements for the term of six months, to be reckoned from the exchange of ratifications of the treaty; and the United States may in the meantime purchase such material from Spain if a satisfactory agreement between the two governments on the subject shall be reached.

ARTICLE 6.—Spain will, upon the signature of this present treaty, release all prisoners of war and all persons detained or imprisoned for political offenses in connection with the insurrections in Cuba and the Philippines and the war with the United States.

Reciprocally, the United States will release all persons made prisoners of war by the American forces, and will undertake to obtain the release of all Spanish prisoners in the hands of the insurgents in Cuba and the Philippines.

The government of the United States will at its own cost return to Spain, and the government of Spain will at its own cost return to the United States, Cuba, Porto Rico, and the Philippines, according to the situation of their respective homes, prisoners released or caused to be released by them, respectively, under this article.

ARTICLE 7.—The United States and Spain mutually relinquish all claims for indemnity, national and individual, of every kind, of either government, or of its citizens or subjects, against the other government, which may have arisen since the beginning of the late insurrection in Cuba and prior to the exchange of ratifications of the present treaty, including all claims for indemnity for the cost of the war. The United States will adjudicate and settle the claims of its citizens against Spain relinquished in this article.

ARTICLE 8.—In conformity with the provisions of Articles 1, 2, and 3 of this treaty, Spain relinquishes in Cuba, and cedes in Porto Rico and other islands in the West Indies, in the island of Guam, and in the Philippine archipelago, all the buildings, wharves, barracks, forts, structures, public highways, and other immovable property which in conformity with law belong to the public domain and as such belong to the Crown of Spain.

And it is hereby declared that the relinquishment or cession, as the case may be, to which the preceding paragraph refers, cannot in any respect impair the property or rights which by law belong to the peaceful possession of property of all kinds of provinces, municipalities, public or private establishments, ecclesiastical or civic bodies or any other associations having legal capacity to acquire and possess property in the aforesaid territories renounced or ceded, or of private individuals, of whatsoever nationality such individuals may be.

The aforesaid relinquishment or cession, as the case may be, includes all documents exclusively referring to the sovereignty relinquished or ceded that may exist in the archives of the peninsula. Where any document in such archives only in part relates to said sovereignty, a copy of such part will be furnished whenever it shall be requested. Like rules shall be reciprocally observed in favor of Spain in respect of documents in the archives of the islands above referred to.

In the aforesaid relinquishment or cession, as the case may be, are also included such rights as the Crown of Spain and its authorities possess in respect of the official archives and records, executive as well as judicial, in the islands above referred to, which relate to said islands or the rights and property of their inhabitants. Such archives and records shall be carefully preserved; and private persons shall, without distinction, have the right to require, in accordance with the law, authenticated copies of the contracts, wills, and other instruments forming part of notarial protocols or

files, or which may be contained in the executive or judicial archives, be the latter in Spain or the islands aforesaid.

ARTICLE 9.—Spanish subjects, natives of the peninsula, residing in the territory over which Spain by the present treaty relinquishes or cedes her sovereignty, may remain in such territory or may remove therefrom, retaining in either event all their rights of property, including the right to sell or dispose of such property or of its proceeds; and they shall also have the right to carry on their industry, commerce, and professions, being subject in respect thereof to such laws as are applicable to other foreigners. In case they remain in the territory, they may preserve their allegiance to the Crown of Spain by making, before a court of record, within a year from the date of the exchange of ratifications of this treaty, a declaration of their decision to preserve such allegiance; in default of which declaration they shall be held to have renounced it and to have adopted the nationality of the territory in which they may reside.

The civil rights and political status of the native inhabitants of the territories hereby ceded to the United States shall be determined by the Congress.

ARTICLE 10.—The inhabitants of the territories over which Spain relinquishes or cedes her sovereignty shall be secured in the free exercise of their religion.

ARTICLE 11.—The Spaniards residing in the territories over which Spain by this treaty cedes or relinquishes her sovereignty shall be subject in matters civil as well as criminal to the jurisdiction of the courts of the country wherein they reside, pursuant to the ordinary laws governing the same; and they shall have the right to appear before such courts and to pursue the same course as citizens of the country to which the courts belong.

ARTICLE 12.—Judicial proceedings pending at the time of the exchange of ratifications of this treaty in the territories over which Spain relinquishes or cedes her sovereignty, shall be determined according to the following rules:

First—Judgments rendered either in civil suits between private individuals or in criminal matters, before the date mentioned, and with respect to which there is no recourse or right of review under the Spanish law, shall be deemed to be final, and shall be executed in due form by competent authority in the territory within which such judgments should be carried out.

Second—Civil suits between private individuals which may on the date mentioned be undetermined shall be prosecuted to judgment before the court in which they may then be pending, or in the court that may be substituted therefor.

Third—Criminal actions pending on the date mentioned before the Supreme Court of Spain, against citizens of the territory which by this treaty ceases to be Spanish, shall continue under its jurisdiction until final judgment; but, such judgment having been rendered, the execution thereof shall be committed to the competent authority of the place in which the case arose.

ARTICLE 13.—The rights of property secured by copyrights and patents acquired by Spaniards in the island of Cuba, and in Porto Rico, the Philippines, and other ceded territories, at the time of the exchange of the ratification of this treaty, shall continue to be respected. Spanish scientific, literary, and artistic works not subversive of public order in the territories in question shall continue to be admitted free of duty into such territories for the period of ten years to be reckoned from the date of the exchange of the ratifications of this treaty.

ARTICLE 14.—Spain shall have the power to establish consular officers in the ports and places of the territories the sovereignty over which has either been relinquished or ceded by the present treaty.

ARTICLE 15.—The government of each country will, for the term of ten years, accord to the merchant vessels of the other country the same treatment in respect to all port charges, including entrance and clearance dues, light dues, and tonnage duties, as it accords to its own merchant vessels not engaged in the coastwise trade.

This article may at any time be terminated on six months' notice given by either government to the other.

ARTICLE 16.—It is understood that any obligations assumed in this treaty by the United States with respect to Cuba are limited to the time of its occupancy thereof; but it will upon the termination of such occupancy advise any government established in the island to assume the same obligations.

ARTICLE 17.—The present treaty shall be ratified by the President of the United States, by and with the advice and consent of the Senate thereof, and by Her Majesty the Queen Regent of Spain; and the ratifications shall be exchanged at Washington within six months from the date hereof, or earlier if possible.

In faith whereof we, the respective plenipotentiaries, have signed this treaty and have hereunto affixed our seals.

Done in duplicate at Paris, the tenth day of December, in the year of our Lord One Thousand Eight Hundred and Ninety-eight.

UNITED STATES DAUGHTERS OF 1812, a society organized in 1892, has now 600 members, descended from an ancestor who rendered civil, military or naval assistance during the War of 1812. President, Mrs. William Gerry Slade; Secretary, Mrs. Leroy S. Smith, New York.

UNITED STATES FISH COMMISSION. See FISHERIES; also ZOOLOGICAL STATIONS (paragraph United States Fish Commission Laboratory).

UNITED WORKMEN, ANCIENT ORDER OF, a fraternal society founded in 1868, has 35 grand lodges, 5,195 sub-lodges and 355,000 members. Since its organization it has disbursed \$86,000,000, and \$7,761,934 during its last fiscal year. Master Workman, H. C. Sessions, Sioux Falls, S. Dak.; Recorder, M. W. Sackett, Meadville, Pa.

UNIVERSAL BROTHERHOOD, founded in New York, January 13, 1898, by Mrs. Katharine A. Tingley, is an outgrowth of the Theosophical Society founded by Mme. H. P. Blavatsky, W. Q. Judge and others in New York in 1875. This was reorganized by W. Q. Judge in Boston in 1895. On February 18, 1898, at the annual convention in Chicago, this Theosophical Society became the literary department of the Universal Brotherhood. Its purpose is to publish and disseminate literature relating to theosophy, philosophy, religion, arts, sciences, etc.; its president is E. Aug. Neresheimer, and its headquarters 144 Madison Avenue, New York. The Universal Brotherhood exists to teach brotherhood to study ancient and modern religion, art, science, philosophy, the divine powers in man and the laws of nature. The Universal Brotherhood has 150 lodges in the United States and Canada, and lodges in England, Ireland, Sweden, Holland, France, Germany, Greece, India, Australia and New Zealand. The headquarters are 144 Madison Avenue, New York. Officers: Katharine A. Tingley, Leader; Frank M. Pierce, Secretary. The International Brotherhood League practises humanitarian work. Officers: Katharine A. Tingley, Founder and President; H. T. Patterson, General Superintendent. Mrs. Tingley founded the Isis League of Music and Drama, under the patronage of the Art Department of the Universal Brotherhood in January, 1898.

UNIVERSALISTS. This organization is reported to have had a prosperous year. During 1898 fifteen new churches were opened, one of which was the Church of the Divine Paternity, New York, which cost half a million of dollars. Conferences were held in Roxbury, Mass., Akron, Ohio, and New York City. The most important event of 1898 was the appointment of a General Superintendent of the Church, with the functions of a bishop. The Universalists report 787 churches, 758 ministers and 48,856 members, while the value of church property is \$9,500,000. The Woman's Centenary Association is a national organization with branches in every State. The Young People's Christian Union has 510 local and 24 State Unions, and a membership of about 12,000. According to the latest report of the Commissioner of Education, the Universalists in the United States control 4 institutions of higher education, with 65 teachers, 491 students and endowments of \$2,030,980. The next General Convention will be held in Boston in October, 1899. Officers: President, C. L. Hutchison, Chicago; Secretary, G. L. Demorest, Manchester, N. H.

UNIVERSITIES AND COLLEGES. Some account of the present status of higher education in the United States will be found in the article EDUCATION IN THE UNITED STATES (q. v.). The object of the present article is limited to the presentation of a list of universities and colleges, with the latest statistics that were available at the time of writing. The difficulty of selecting the names of institutions which should be included in such a list may be inferred from the lack of uniformity in the standards of admission, upon which the following comments are made in the report of the Commissioner of Education: "One of the most discouraging features in our system of higher education is the lack of any definite, or, in fact, in a large number of States, the lack of any requirements or conditions exacted of institutions when they are chartered and authorized to confer degrees. This condition of affairs is largely, if not entirely, responsible for the large number of weak so-called colleges and universities scattered throughout our country, institutions that are no better than high schools, and in a large number of cases do not furnish as good an education as may be obtained in good secondary schools. Nevertheless, these institutions are chartered and granted authority to confer all degrees usually granted by universities and colleges in the United States."

A fairly complete list of chartered institutions calling themselves colleges, and having authority to confer degrees, must necessarily include many institutions which in point of educational standards belong to a lower class than some which, not having the technical requirements or not assuming the title, do not appear in the list. The inconsistencies are those of the system itself.

UNIVERSITIES AND COLLEGES.

of universities and colleges in the United States is compiled chiefly from the last report of the United States Commission-
and from catalogues and other data received direct from the institutions. Colleges for men only are designated A; for both
men and women B; and for women only, C.

NAME.	LOCATION.	PRESIDENT.	Denomination.	Organized.	Officers of In- stitution.	Students.	College courses.	Board of Trusts or Faculty.	Value of Buildings, Grounds and Furniture.	Amount of Endowment.
B Add-Ran Christ. Univ.	Waco, Tex.	Adison Clark, LL.D.	Christ.	1873	14	164	164	2,000	140,000	0
B Adelphi College	Brooklyn, Borough, N. Y.	C. H. Levermore, Ph.D.	None.	1865	70	1,094	1,094	2,000	424,218	85,000
B Adair College	Greensboro, N. C.	David Jones, D.D. (ack.)	M. E.	1869	15	217	46	2,000	140,000	0
B Ag. and Mech. Col. for Colored Race.	College Sta., Tex.			1864	9	78	10	600	43,500	0
A Ag. and Mech. Col. of Texas	Selma, Ala.			1876	28	297	0	4,750	213,466	200,000
B Alabama Bapt. Colored Univ.	Tuskegee, Ala.	John Musey, A.M., LL.D.	Bapt.	1873	28	297	0	600	80,000	0
B Ala. Conference Econ. Coll.	Auburn, Ala.	W. LeRoy Brown, M. A., LL.D.		1865	94	9	56	2,500	90,000	0
B Alabama Polytechnic Institute	University, Ala.	Jas. K. Powers, LL.D.	None.	1872	89	341	12	9,000	145,813	225,500
B Alabama, University of	Charlottesville, Va.	Miss Virginia Southgate, Prin.	Bapt.	1881	27	318	49	15,000	800,000	300,000
B Albemarle College	Albion, Mich.	J. P. Ashley, S.T.B., Ph.D.	Presb.	1887	8	97	38	50	8,000	0
B Albion College	Albion, Mich.	Rev. B. C. Davis, Ph.D.	M. E.	1868	9	68	49	2,000	90,000	85,000
B Albion Ag. and Mech. College	Westfield, Mass.	Wm. H. Crawford, D.D.		1843	90	487	31	11,600	135,000	300,000
B Alfred University	Alfred, N. Y.	J. S. Thompson, D.D.	Seventh-Day Bap.	1866	16	845	35	2,900	85,800	118,875
B Allegheny College	Allegheny, Pa.	A. F. Spruick, D.D., LL.D.	M. E.	1866	21	230	26	12,000	80,000	274,000
B Allen University	Columbia, S. C.	Rev. J. P. Hurst, D.D., M.A. (sec.)	A. M. E.	1817	21	320	16	14,000	80,000	800,000
B Allentown College for Women	Allentown, Pa.	Rev. J. P. Hurst, D.D., M.A. (sec.)	Reformed.	1881	9	279	8	800	60,000	0
B Alma College	Alma, Mich.	Rev. J. P. Hurst, D.D., M.A. (sec.)	Presb.	1887	15	110	60	26,000	51,000	85,000
B American Temperance Univ.	Hartford, Conn.	Rev. J. P. Hurst, D.D., M.A. (sec.)	M. E.	1887	30	400	36	600	100,000	0
B American University	Washington, D. C.	Rev. J. P. Hurst, D.D., M.A. (sec.)	None.	1881	26	380	110	70,000	760,000	1,422,404
B Amherst College	Amherst, Mass.	Rev. J. P. Hurst, D.D., M.A. (sec.)	None.	1862	15	210	30	2,000	50,000	800,000
B Andover Theological Sem.	Andover, Mass.	Rev. J. P. Hurst, D.D., M.A. (sec.)	Cong.	1868	9	40	50	51,000	80,000	0
B Andover Female College	Andover, Mass.	Rev. J. P. Hurst, D.D., M.A. (sec.)	M. E. So.	1854	12	178	36	7,000	100,000	70,000
B Antioch College	Yellow Springs, O.	Rev. J. P. Hurst, D.D., M.A. (sec.)	None.	1853	15	138	36	8,100	86,000	0
B Arizona, University of	Tucson, Ariz.	Rev. J. P. Hurst, D.D., M.A. (sec.)	M. E.	1890	9	210	56	500	55,000	0
B Arkadelphia Meth. Coll.	Arkadelphia, Ark.	Rev. J. P. Hurst, D.D., M.A. (sec.)	Presb.	1873	7	75	55	2,500	25,000	5,200
B Arkansas College	Batesville, Ark.	Rev. J. P. Hurst, D.D., M.A. (sec.)	Cumb. Presb.	1881	17	80	46	2,400	35,000	30,000
B Arkansas Cumberland College	Clarksville, Ark.	Rev. J. P. Hurst, D.D., M.A. (sec.)	None.	1873	48	730	320	7,400	127,000	130,000
B Arkansas Induct. Univ.	Fayetteville, Ark.	Rev. J. P. Hurst, D.D., M.A. (sec.)	None.	1888	68	1,200	78	2,000	2,000,000	0
B Armour Inst. of Technology	Chicago, Ill.	Rev. J. P. Hurst, D.D., M.A. (sec.)	M. E. So.	1884	15	140	81	1,000	100,000	0
B Asheville College	Asheville, N. C.	Rev. J. P. Hurst, D.D., M.A. (sec.)	M. E. So.	1884	13	899	50	500	50,000	0
B Athens Female College	Athens, Ala.	Rev. J. P. Hurst, D.D., M.A. (sec.)	Bapt.	1887	5	43	15	8,000	34,300	20,000
B Atlanta Baptist College	Atlanta, Ga.	Rev. J. P. Hurst, D.D., M.A. (sec.)	Presb.	1887	28	208	18	9,400	250,000	10,461
B Atlanta University	Atlanta, Ga.	Rev. J. P. Hurst, D.D., M.A. (sec.)	Presb.	1880	10	100	100	85,477	85,477	660,000

* To residence + To non-residence.

NAME	LOCATION	PRESIDENT	DENOMINATION	Organized	Officers of Ia.	Students	College Ex.	Real Est. Value of Library	Value of Buildings and Grounds	Amount of Endowment
A Augsburg Seminary	Minneapolis, Minn.	George Sverdrup	Luth.	1890	7	104	\$ 35	1,500	100,000	\$ 40,000
A Angustana College	Rock Island, Ill.	C. Olsson, D.D.	Luth.	1807	25	612	80	16,000	210,000	80,000
A Andin College	Edinburgh, N.J.	W. E. Lugenbeel, Ph.D.	None	1891	11	350	47	2,000	40,000	0
A Austin College	Stevenson, Tex.	T. R. Sampson, D.D.	Presb.	1850	19	116	61	7,000	50,000	70,000
A Avalon College	Trouton, Mo.	C. J. Kepbart, D.D.	U. B.	1895	1	195	40	1,000	50,000	0
B Bailey Springs	Baldwin Springs, Ala.	None	None	1898	8	205	40	1,000	20,000	0
B Baker University	Baldwin Kan.	Levi H. Mullin	M. E.	1858	23	550	80	5,000	80,000	40,000
B Baldwin University	Benton, Mo.	M. F. Warner, A.M., D.D.	M. E.	1858	23	550	80	5,000	80,000	40,000
B Bangor Theolog. Sem.	Bangor, Me.	H. L. Chapman, D.D.	Cong.	1816	7	98	50	20,000	150,000	77,000
B Baptist Female College	Lexington, Mo.	J. P. Marshall, V.P.	Bapt.	1855	15	108	50	800	10,000	0
B Baraboo College	Baraboo, Wis.	Emily J. Smith, A.B. (dean).	M. E. So.	1898	7	95	48	600	20,000	0
B Barnard College	Manhasset Neck, N. Y.	G. K. Bartholomew, Ph.D.	None	1899	25	208	165	1,000	618,000	28,740
B Bartholomew Eng. and Class School	Cincinnati, O.	Geo. C. Chase, D.D.	P. E.	1875	16	98	160	1,000	28,000	0
B Bates College	Lebanon, Me.	E. A. Sutherland	Free Bapt.	1863	14	278	65	14,946	180,000	288,000
B Battle Creek College	Battle Creek, Mich.	J. C. Lattimer	Seven-Day Adv.	1878	25	394	35	2,000	100,000	0
B Baylor College	Waco, Tex.	E. D. Easton, D.D.	Bapt.	1845	14	205	58	2,500	100,000	0
B Baylor University	Waco, Tex.	L. T. Fitzhugh, A.M.	Bapt.	1845	23	530	58	5,000	200,000	3,500
B Belhaven Col. for Young Ladies	Bellevue, Mo.	E. D. Easton, D.D.	None	1894	13	144	60	1,000	40,000	0
B Beloit College	Beloit, Wis.	Rev. J. G. Rodgers	Cong.	1847	26	485	49	25,000	325,000	402,000
B Berea College	Berea, Ky.	Wm. G. Frost, D.D.	Cong.	1860	16	128	0	6,000	57,000	0
B Bethany College	Bethany, W. Va.	Rev. C. Stevenson, D.D.	None	1855	27	578	0	19,000	114,000	201,500
B Bethany College	Bethany, W. Va.	B. C. Hagerman, A.M.	Luth.	1881	30	500	45	5,000	125,000	0
B Bethel College	Bethel, Me.	E. S. Alderman, D.D.	Christian	1841	14	500	50	5,000	200,000	0
B Bethel College	Bethel, Me.	Rev. J. L. Dickens, Ph.D.	Bapt.	1864	6	189	35	5,000	55,000	80,000
B Bethel Female College	Bethel, Me.	D. J. Sanders, D.D.	Cumb. Presb.	1850	6	175	40	1,000	20,000	0
B Black Hills College	Black Hills, S. D.	W. B. Bradley, A.M. (act.)	Bapt.	1874	13	95	50	1,000	30,000	0
B Blackburn University	Blackburn, N. C.	Elmer E. Lymer	Presb.	1881	13	212	43	8,500	180,000	7,000
B Black College	Black College, N. C.	None	Presb.	1881	9	100	43	3,000	80,000	96,000
B Black School of Electricity	Washington, D. C.	None	M. E.	1890	8	88	39	500	20,000	20,000
B Blount College	Blount College, Ala.	B. G. Lowrey	None	1890	6	351	43	100	7,400	0
B Blue Mountain Female College	Blue Mountain, Miss.	None	None	1873	16	179	51	1,500	20,000	0
B Borden Female College	Borden, N. J.	Rev. T. Bronsahan, S.J.	None	1893	11	277	50	2,500	20,000	0
B Boston College	Boston, Mass.	W. F. Warren, S.T.D., LL.D.	R. C.	1863	17	477	60	30,000	400,000	0
B Boston University	Boston, Mass.	W. D. Hyde, D.D.	M. E.	1873	137	1,454	110	18,467	800,000	780,000
B Bowdoin College	Bowdoin, Me.	Vesley D. Whitley	None	1794	23	369	75	60,250	600,000	549,475
B Bowdoin College	Bowdoin, Me.	None	None	1857	7	150	27	150	2,000	0
B Bridgewater College	Bridgewater, Va.	Wm. J. Kerr, B.S., B.D.	Presb.	1862	23	261	39	2,500	140,000	11,000
B Brigham Young College	Brigham Young, Utah	Benj. F. Clarke, A.M.	L.D.S.	1891	28	585	150	100,000	1,177,897	96,437
B Brown University	Brown, R.I.	N. Carey Thomas, Ph.D.	None	1764	79	285	61	1,790	15,000	1,160,000
B Brownville Female College	Brownville, Pa.	Rev. Ira A. Priest	Bapt.	1885	44	100	50	25,000	800,000	0
B Bryn Mawr College	Bryn Mawr, Pa.	None	None	1873	15	179	46	7,000	300,000	288,000
B Bucknell College	Bucknell, Pa.	J. H. Harris, LL.D., Ph.D.	Universalist	1873	15	179	46	7,000	300,000	288,000
B Bucknell University	Lewistown, Pa.	None	Bapt.	1846	29	425	85	16,000	250,000	420,000

NAME	LOCATION	PRESIDENT	Denominations	Organizations	Students	Collegiate Ex.	Board of Trustees	Value of Grounds and Buildings	Amount of Bonds
1. University of Alabama	Tuscaloosa, Ala.	W. N. Billingsley, A. M.	Presb.	1891	1,450	\$ 40	400	28,000	0
2. University of Arkansas	Fayetteville, Ark.	Dr. J. H. Brown (ret.)	Christian	1848	120	44	8,750	15,000	250,000
3. University of California	Berkeley, Cal.	Scott Baker, A. M., LL. D.	None	1865	91	98	8,000	150,000	254,449
4. University of Colorado	Boulder, Colo.	J. C. Rely, D. D.	None	1860	690	70	1,200	75,000	35,000
5. University of Connecticut	New Haven, Conn.	Rev. T. B. Brownson, D. D.	Bapt.	1839	188	53	3,400	84,000	1,933,225
6. University of Delaware	Dover, Del.	Samuel R. Knapp, LL. D. (resigned)	None	1870	45	70	76,000	1,770,353	0
7. University of Florida	Gainesville, Fla.	Rev. J. B. Thomas, S. J.	None	1868	230	62	10,000	288,005	0
8. University of Georgia	Athens, Ga.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
9. University of Illinois	Urbana, Ill.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
10. University of Indiana	Bloomington, Ind.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
11. University of Iowa	Iowa City, Ia.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
12. University of Kentucky	Lexington, Ky.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
13. University of Louisiana	Baton Rouge, La.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
14. University of Maine	Brunswick, Me.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
15. University of Maryland	College Park, Md.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
16. University of Massachusetts	Amherst, Mass.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
17. University of Michigan	Ann Arbor, Mich.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
18. University of Minnesota	St. Paul, Minn.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
19. University of Missouri	Columbia, Mo.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
20. University of Montana	Helena, Mont.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
21. University of Nebraska	Lincoln, Neb.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
22. University of Nevada	Reno, Nev.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
23. University of New Hampshire	Durham, N. H.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
24. University of New Jersey	Princeton, N. J.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
25. University of New York	Albany, N. Y.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
26. University of North Carolina	Chapel Hill, N. C.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
27. University of North Dakota	Grand Forks, N. D.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
28. University of Ohio	Columbus, Ohio	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
29. University of Oklahoma	Norman, Okla.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
30. University of Oregon	Eugene, Ore.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
31. University of Pennsylvania	Philadelphia, Pa.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
32. University of Rhode Island	Providence, R. I.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
33. University of South Carolina	Columbia, S. C.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
34. University of South Dakota	Spearhead, S. D.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
35. University of Tennessee	Knoxville, Tenn.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
36. University of Texas	Austin, Tex.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
37. University of Utah	Salt Lake City, Utah	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
38. University of Vermont	Windsor, Vt.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
39. University of Virginia	Charlottesville, Va.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
40. University of Washington	Seattle, Wash.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
41. University of Wisconsin	Madison, Wis.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0
42. University of Wyoming	Laramie, Wyo.	Rev. J. B. Thomas, S. J.	None	1870	200	950	30,000	200,000	0

* For non-residents.

[illegible]

* To residents.
† To non-residents.

See	NAME	LOCATION	PRESIDENT	Denominations	Organized	Officers of In- struction	Students	Collegiate Ex- penses	Books Val- ued by	Value of Buildings	Amount of Funds
C	Danville College for Young Ladies	See <i>Handbook Negro System</i>	Wm. J. Tucker, D.D., LL.D.	Cong.	1789	56	697	\$108	80,000	\$ 400,000	\$ 1,084,778
A	Dartmouth College	Randover, N. H.	J. E. Shearer, D.D., LL.D.	Presb.	1787	10	121	78	11,000	180,000	180,000
B	Davidson College	Davidson, N. C.	J. E. H. Litchaw, A.M., D.D.	None	1864	14	267	11*	180	90,000	0
A	Delaware College	Dedance, O.	Geo. A. Harter, A.M., Ph.D.	Bapt.	1868	18	91	71*	8,500	88,700	88,000
B	Delaware State Col. for Colored Stud.	Dover, Del.	Dan. B. Furman, Ph.D., LL.D.	Bapt.	1868	4	48	0	400	18,900	0
B	Denison Univ.	Granville, O.	Wm. F. McDowell, Ph.D., S.T.D.	Bapt.	1861	27	878	46	19,000	190,000	410,000
B	De Pauw University	Greencastle, Ind.	H. A. Gobin, D.D.	M. E.	1867	97	383	83	8,400	850,000	...
B	Des Moines College	Des Moines, Ia.	H. L. Steadon, D.D. (act.)	M. E.	1867	84	685	86	94,000	880,000	\$16,000
A	Detroit College	Detroit, Mich.	Rev. Jas. D. Foley, S.J.	Bapt.	1863	10	153	36	26	4,000	52,776
B	Dickinson College	Carlisle, Pa.	Geo. K. Reed, S.T.D., LL.D.	R. U.	1877	80	232	40	9,600	40,000	8,000
B	Doane College	Crest, Neb.	Rev. David B. Berry, A.M.	M. E.	1768	26	286	56	44,000	328,200	945,890
B	Drake University	Des Moines, Ia.	Wm. B. Craig, D.D.	Cong.	1873	10	208	36	7,880	182,000	62,776
B	Drake Theolog. Sem.	Madison, N. J.	H. A. Buttz, D.D., LL.D.	Christ.	1861	60	1,100	40	4,500	145,000	189,690
A	Drew College	Springfield, Mo.	Rev. H. T. Fuller, Ph.D.	M. E.	1867	7	176	51	48,000	300,000	805,662
B	Druy College	Due West, S. C.	None	None	1873	17	203	61	28,000	8,000	800,000
B	Due West Female College	Pittsburg, Pa.	J. J. Miller, A.M., LL.D.	None	1866	19	126	38	2,000	100,000	100,000
B	Duquesne College	Richmond, Ind.	None	Friends	1861	14	186	76	2,000	80,000	0
B	Earlham College	East Lake, Ala.	None	None	1860	11	241	45	600	80,000	0
C	East Lake Athenaeum	East Lake, Ala.	None	M. E.	1860	11	241	45	600	80,000	0
C	East Mississippi Female College	Meridian, Miss.	None	None	1860	18	263	62	5,000	25,000	0
C	Eliz. Aull Female Sem.	Lexington, Mo.	None	Presb.	1866	6	60	50	800	90,000	0
C	Elmira College	Elmira, N. Y.	A. C. MacKenzie, D.D.	Presb.	1865	75	75	75	6,000	168,000	72,000
B	Elon College	Elon College, N. C.	W. W. Stadle, D.D.	Presb.	1865	13	100	60	1,500	60,000	102,000
B	Emory College	Oxford, Ga.	C. E. Dowd, D.D.	Christ.	1867	15	267	43	20,000	186,000	928,000
A	Emory and Henry College	Emory, Va.	H. C. Simmons, D.D.	M. E. So.	1866	10	118	62	10,000	100,000	10,000
B	Erskine College	Duo West, S. C.	W. G. Waterhouse, D.D.	M. E. So.	1866	6	80	25	1,000	60,000	32,000
B	Eureka College	Eureka, Ill.	J. H. Hurlin, A.M., LL.D.	Presb.	1866	17	210	59	2,100	160,000	45,000
B	Evangelical Free Seminary	Elmhurst, Ill.	See <i>Presbyterian College</i>	Disciples	1865	17	210	59	2,100	160,000	45,000
C	Evangelical Seminary	Princeton, N. J.	J. A. Leavitt, D.D.	None	1867	6	87	180	2,000	25,000	0
B	Evangelical Seminary	Ewing, Ill.	None	Bapt.	1867	18	186	35	2,000	25,000	0
B	Fairfield College	Fairfield, Neb.	Rev. N. J. Morrison, D.D., LL.D.	Christ.	1864	9	81	33	800	30,000	0
B	Fairmount College	Wichita, Kan.	None	Cong.	1869	16	179	30	8,000	60,000	0
B	Fargo College	Fargo, N. D.	None	Cong.	1868	8	166	36	5,000	47,000	30,000
B	Findlay College	Findlay, O.	Rev. Chas. Manchester, D.D.	Ch. of God.	1869	10	215	10	600	100,000	30,000
B	Flint University	Nashville, Tenn.	E. M. Cavitt, D.D.	Cong.	1867	23	453	15	6,367	250,000	60,000
B	Florida Conference College	Lansburg, Fla.	None	M. E. So.	1868	10	109	54	2,000	15,000	0
B	Florida State Ag. College	Lake City, Fla.	W. F. Yocum, A.M., D.D.	None	1868	16	190	37*	2,000	22,265	134,300
B	Fort Worth Univ.	Fort Worth, Tex.	O. L. Fisher, D.D.	M. E.	1861	50	1,341	50	10,000	125,000	0
B	Franklin College	Franklin, Ind.	W. T. Stiles, D.D.	Bapt.	1861	11	271	40	5,000	55,000	191,000
B	Franklin College	New Athens, O.	W. A. Williams, D.D.	None	1866	...	...	40	...	15,000	0

* For students. † To meet students

NAME	LOCATION	PRESIDENT	Organization	Students	Colleges and Universities	Bonds to Libraries	Value of Grounds and Buildings	Amount of Funds
Harvard College	Cambridge, Mass.	Frederick A. Patterson	Harvard University	1,000	10	100,000	1,000,000	10,000,000
Yale University	New Haven, Conn.	James H. Burr	Yale University	1,000	10	100,000	1,000,000	10,000,000
Columbia University	New York, N. Y.	Frederick A. Patterson	Columbia University	1,000	10	100,000	1,000,000	10,000,000
University of Chicago	Chicago, Ill.	Frederick A. Patterson	University of Chicago	1,000	10	100,000	1,000,000	10,000,000
University of Wisconsin	Madison, Wis.	Frederick A. Patterson	University of Wisconsin	1,000	10	100,000	1,000,000	10,000,000
University of Michigan	Ann Arbor, Mich.	Frederick A. Patterson	University of Michigan	1,000	10	100,000	1,000,000	10,000,000
University of California	Berkeley, Calif.	Frederick A. Patterson	University of California	1,000	10	100,000	1,000,000	10,000,000
University of Texas	Austin, Tex.	Frederick A. Patterson	University of Texas	1,000	10	100,000	1,000,000	10,000,000
University of Illinois	Urbana, Ill.	Frederick A. Patterson	University of Illinois	1,000	10	100,000	1,000,000	10,000,000
University of Minnesota	Minneapolis, Minn.	Frederick A. Patterson	University of Minnesota	1,000	10	100,000	1,000,000	10,000,000
University of Pennsylvania	Philadelphia, Pa.	Frederick A. Patterson	University of Pennsylvania	1,000	10	100,000	1,000,000	10,000,000
University of Maryland	College Park, Md.	Frederick A. Patterson	University of Maryland	1,000	10	100,000	1,000,000	10,000,000
University of North Carolina	Chapel Hill, N. C.	Frederick A. Patterson	University of North Carolina	1,000	10	100,000	1,000,000	10,000,000
University of South Carolina	Columbia, S. C.	Frederick A. Patterson	University of South Carolina	1,000	10	100,000	1,000,000	10,000,000
University of Georgia	Athens, Ga.	Frederick A. Patterson	University of Georgia	1,000	10	100,000	1,000,000	10,000,000
University of Florida	Gainesville, Fla.	Frederick A. Patterson	University of Florida	1,000	10	100,000	1,000,000	10,000,000
University of Alabama	Tuscaloosa, Ala.	Frederick A. Patterson	University of Alabama	1,000	10	100,000	1,000,000	10,000,000
University of Mississippi	Oxford, Miss.	Frederick A. Patterson	University of Mississippi	1,000	10	100,000	1,000,000	10,000,000
University of Louisiana	Baton Rouge, La.	Frederick A. Patterson	University of Louisiana	1,000	10	100,000	1,000,000	10,000,000
University of Arkansas	Fayetteville, Ark.	Frederick A. Patterson	University of Arkansas	1,000	10	100,000	1,000,000	10,000,000
University of Missouri	Columbia, Mo.	Frederick A. Patterson	University of Missouri	1,000	10	100,000	1,000,000	10,000,000
University of Iowa	Iowa City, Ia.	Frederick A. Patterson	University of Iowa	1,000	10	100,000	1,000,000	10,000,000
University of Nebraska	Lincoln, Neb.	Frederick A. Patterson	University of Nebraska	1,000	10	100,000	1,000,000	10,000,000
University of Kansas	Lawrence, Kan.	Frederick A. Patterson	University of Kansas	1,000	10	100,000	1,000,000	10,000,000
University of Oklahoma	Norman, Okla.	Frederick A. Patterson	University of Oklahoma	1,000	10	100,000	1,000,000	10,000,000
University of Colorado	Boulder, Colo.	Frederick A. Patterson	University of Colorado	1,000	10	100,000	1,000,000	10,000,000
University of New Mexico	Albuquerque, N. M.	Frederick A. Patterson	University of New Mexico	1,000	10	100,000	1,000,000	10,000,000
University of Arizona	Tucson, Ariz.	Frederick A. Patterson	University of Arizona	1,000	10	100,000	1,000,000	10,000,000
University of New York	Albany, N. Y.	Frederick A. Patterson	University of New York	1,000	10	100,000	1,000,000	10,000,000
University of Vermont	Windsor, Vt.	Frederick A. Patterson	University of Vermont	1,000	10	100,000	1,000,000	10,000,000
University of New Hampshire	Durham, N. H.	Frederick A. Patterson	University of New Hampshire	1,000	10	100,000	1,000,000	10,000,000
University of Maine	Orono, Me.	Frederick A. Patterson	University of Maine	1,000	10	100,000	1,000,000	10,000,000
University of Idaho	Boise, Idaho	Frederick A. Patterson	University of Idaho	1,000	10	100,000	1,000,000	10,000,000
University of Montana	Helena, Mont.	Frederick A. Patterson	University of Montana	1,000	10	100,000	1,000,000	10,000,000
University of Wyoming	Laramie, Wyo.	Frederick A. Patterson	University of Wyoming	1,000	10	100,000	1,000,000	10,000,000
University of Nevada	Reno, Nev.	Frederick A. Patterson	University of Nevada	1,000	10	100,000	1,000,000	10,000,000
University of Utah	Salt Lake City, Utah	Frederick A. Patterson	University of Utah	1,000	10	100,000	1,000,000	10,000,000

NAME	LOCATION	PERMANENT	Dedication	Organized	Officers of Ia.	Students	Collegiate Ex.	Bound Vol.	Value of Books and Manuscripts	Amount of Private Contributions
Kansas, University of	Lawrence, Kan.	F. H. Bove, Ph.D., LL.D.	None.	1885	50	1,064	0	25	\$60,000	\$180,000
Kansas Wesleyan Univ.	Salina, Kan.	G. J. Haggerty, A.M.	M. E.	1885	15	474	0	25	20,000	0
Kean College	Kearney, Mo.	C. W. Tomlinson	Bapt.	1886	8	100	50	1,000	40,000	0
Ree Mar College	Hagerstown, Md.	Rev. C. L. Keedy, A.M., M.D.	Lab.	1886	100	100	50	2,000	50,000	1,000
Kentucky Coll. for Y. L.	Pewee Valley, Ky.	Rev. T. Simpson McCall, M.A.	None.	1886	50	70	0	0	40,000	0
Kentucky University	Lexington, Ky.	Benb. L. Cave, D.D.	Chas.	1878	75	281	28	15,000	300,000	300,479
Kentucky Wesleyan Univ.	Winchester, Ky.	Eng. H. Pearce, D.D.	M. E. So.	1880	74	485	50	2,000	75,000	20,000
Kearney College	Gambler, O.	W. F. Peirce, L.H.D.	P. E.	1885	94	158	105	28,000	300,000	300,375
Konka College	Konka Park, N. Y.	Geo. H. Hall, D.D.	Pres. Bapt.	1888	12	150	0	0	50,000	0
Knox College	Bristol, Tenn.	J. A. Wallace, D.D.	Presb.	1887	4	75	0	5,000	20,000	20,000
Knox College	Galesburg, Ill.	J. H. Finley, Ph.D.	None.	1887	40	600	70	10,000	300,000	300,000
Knox College	Knoxville, Tenn.	Geo. R. McNeill, Ph.D.	U. Presb.	1875	56	7	0	0	100,000	0
Knox College	La Fayette, Ala.	E. D. Wardlaw, LL.D.	U. Presb.	1883	13	114	15	2,000	15,000	0
Knox College	Easton, Pa.	None.	None.	1883	58	280	0	0	600,000	300,000
Knox College	La Fayette, Ore.	None.	U. Presb.	1888	4	28	28	5,000	8,000	0
Knox College	La Grange, Mo.	None.	U. Presb.	1888	11	150	40	1,000	45,000	10,000
Knox College	La Grange, Ga.	None.	Bapt.	1885	30	940	50	5,000	100,000	0
Knox College	Palmer, Mo.	None.	M. E. So.	1889	30	110	0	0	5,000	84,000
Knox College	Lake Forest, Ill.	None.	Presb.	1889	28	110	0	0	800,000	250,000
Knox College	Cincinnati, O.	None.	Presb.	1870	158	2,170	60	15,000	400,000	0
Knox College	Cincinnati, O.	None.	Presb.	1888	5	35	0	0	40,000	0
Knox College	Cincinnati, Kan.	None.	U. E.	1885	6	185	27	0	0	0
Knox College	Philadelphia, Pa.	None.	R. C.	1883	16	211	0	0	800,000	0
Knox College	Asbury Park, N. J.	None.	None.	1881	289	154	100	2,500	140,000	0
Knox College	Appleton, Wis.	None.	M. E.	1887	28	575	15	15,000	280,000	915,000
Knox College	Annapolis, Md.	None.	U. E.	1886	19	304	41	4,000	50,000	11,000
Knox College	St. Bethlehem, Pa.	None.	None.	1888	45	588	60	97,000	1,300,000	1,300,000
Knox College	Stanford University, Cal.	None.	None.	1891	89	1,254	30-50	86,000	2,000,000	8,000,000
Knox College	New Orleans, La.	None.	Bapt.	1870	6	67	0	0	175,000	50,000
Knox College	Hickory, N. C.	None.	Lab.	1881	10	140	37	100	85,000	0
Knox College	Hopkinton, Ia.	None.	Presb.	1886	10	140	30	2,400	31,000	0
Knox College	Glasgow, Ky.	None.	Bapt.	1875	7	184	40	0	35,000	0
Knox College	Liberty, Mo.	None.	None.	1880	15	146	50	1,400	15,000	0
Knox College	Lincoln, Ill.	None.	Presb.	1888	10	281	48	380	50,000	0
Knox College	Lincoln University, Pa.	None.	Cumb. Presb.	1885	12	180	40	9,000	40,000	48,000
Knox College	Lehigh, Pa.	None.	Presb.	1854	10	166	46	14,000	175,000	467,350
Knox College	St. Charles, Mo.	None.	Moravian	1794	15	67	0	0	30,000	0
Knox College	Lincoln, Mo.	None.	Presb.	1880	14	60	25	2,000	75,000	25,000
Knox College	Lincoln, Mo.	None.	None.	1880	6	805	26	0	4,500	0
Knox College	Salisbury, N. C.	None.	A. M. E.	1886	11	365	20	3,500	135,000	2,500
Knox College	Roseville, Ky.	None.	M. E. So.	1886	13	119	55	1,500	30,000	2,000
Knox College	Longwood College	None.	Univers.	1851	13	191	54	7,000	40,000	100,000
Knox College	Longwood Univ.	None.	M. E.	1851	13	191	54	7,000	40,000	0
Knox College	Longwood Univ.	None.	M. E.	1857	6	90	60	1,000	10,000	0
Knox College	Longwood Univ.	None.	M. E.	1857	6	90	60	1,000	10,000	0
Knox College	Louisiana State Univ.	None.	None.	1880	20	280	7	20,000	300,000	315,315

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• To residents, • To non residents.

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* Co-educational in law, pedagogy, and graduate school.

Sts.	NAME	LOCATION	PRESIDENT.	Denominations.	Organized.	Officers of In-	Students.	Collegiate Ex-	Bonded Vol-	Value of Buildings.	Amount of President's Funds.
A	Bethel College	N. Brunswick, N. J.	Asst. Sec. Scott, L. L. D.	Dutch Ref	1766	26	160	99	84,500	10,000	0
B	Bethel College	Portland, Me.	W. E. Abernethy, A. M.	None.	1803	30	125	30	9,500	0	0
A	St. Benedict's College	Atchafalaya, N. C.	Very Rev. V. Huber, O. S. B.	R. C.	1801	12	66	60	2,000	0	0
A	St. Benedict's College	Atchafalaya, N. C.	Rev. Rev. Innocent Wolf, O. S. B.	R. C.	1858	94	135	40	14,000	0	0
A	St. Bernard's College	Newark, N. J.	None.	R. C.	1864	0	96	60	1,000	80,000	0
A	St. Bonaventure's College	Albany, N. Y.	None.	R. C.	1869	18	138	45	8,000	55,000	0
A	St. Charles College	East City, Md.	None.	R. C.	1869	16	174	45	7,947	100,000	8,000
B	St. Edward's College	St. Charles, Mo.	C. B. Schranz, A. S. A. M.	R. C.	1864	17	306	60	15,650	800,000	0
A	St. Francis College	Atchafalaya, N. C.	P. J. Weller, A. M.	R. C.	1869	35	150	60	8,000	100,000	0
A	St. Francis Solana Coll.	Brooklyn, N. Y.	Bro. Jerome, O. S. F.	R. C.	1869	35	367	60	4,100	166,000	0
A	St. Francis Xavier Coll.	Quincy, Ill.	Rev. P. N. Leonard, O. F. M.	R. C.	1860	14	166	60	4,000	135,000	0
A	St. Ignace's College	Manhattan Boro., N. Y. C.	Rev. T. E. Murphy, S. J.	R. C.	1847	40	733	68	27,400	760,000	0
A	St. Ignace's College	San Francisco, Cal.	Very Rev. J. P. Freiden, S. J.	R. C.	1855	94	455	106	26,000	800,000	0
A	St. Ignace's College	Cincinnati, O.	Rev. J. J. Schulte, S. J.	R. C.	1869	81	477	40	30,000	300,000	0
A	St. John's College	Annapolis, Md.	Thos. Fell, L. L. D.	None.	1866	18	168	56	7,500	180,000	0
A	St. John's College	Brooklyn, N. Y. C.	Very Rev. J. J. Sullivan, G. M.	R. C.	1860	13	168	56	7,500	180,000	0
A	St. John's College	Portland, N. Y. C.	Rev. T. J. Chas. A. M.	R. C.	1866	13	168	56	7,500	180,000	0
A	St. John's Lutheran College	Waldorf, Kas.	Rev. A. Meyer	R. C.	1866	38	350	60	26,000	840,000	0
A	St. Joseph's University	Collegeville, Minn.	Rev. P. J. Engle, Ph. D.	R. C.	1871	26	350	60	6,000	800,000	0
A	St. Joseph's University	Cincinnati, O.	Rev. M. Schurr, S. C.	R. C.	1871	26	350	60	6,000	800,000	0
A	St. Lawrence University	Canton, N. Y.	John C. Lee, S. T. D.	Unvers.	1863	16	144	56	11,873	104,000	840,000
A	St. Leo College	St. Leo, Fla.	Rev. F. Charles, O. S. B.	R. C.	1869	14	108	70	2,000	28,000	0
A	St. Louis College	San Antonio, Tex.	Bro. John Wolf	R. C.	1864	14	108	70	2,000	28,000	0
C	St. Louis Seminary	Jennings, Mo.	B. T. Blount, L. L. D.	None.	1871	81	838	80	3,000	60,000	0
A	St. Mary's College	St. Louis, Mo.	Rev. J. G. G. S. J.	R. C.	1869	27	340	80	7,300	180,000	0
A	St. Mary's College	St. Mary's, Kan.	Rev. J. G. G. S. J.	R. C.	1869	27	340	80	7,300	180,000	0
A	St. Mary's College	Belmont, N. C.	Rev. J. G. G. S. J.	R. C.	1878	14	138	56	7,500	180,000	0
A	St. Mary's School	Knoxville, Tenn.	Rev. C. W. Lefebvre, Ph. D.	Prot. Ep.	1868	13	113	60	2,000	100,000	0
A	St. Mary's University	Galveston, Tex.	Rev. John R. Quinn, S. J.	R. C.	1864	14	115	75	3,000	170,000	0
A	St. Melina College	St. Melina, Ind.	None.	R. C.	1867	14	115	75	3,000	170,000	0
A	St. Patrick's College	North St. Minn.	Rev. Th. N. Mohr	R. C.	1874	13	135	10	1,750	28,000	4,000
A	St. Stephen's College	Annandale, N. Y.	Rev. C. W. Herzig, A. M.	R. C.	1869	7	100	90	1,900	254,800	12,000
A	St. Vincent's College	Bearfield, Pa.	Rev. M. J. N. S. V.	R. C.	1874	81	335	60	7,000	300,000	0
A	St. Vincent's College	Los Angeles, Cal.	Rev. J. A. Linn, C. M.	R. C.	1865	16	150	50	8,000	40,000	0
A	St. Vincent's College	Los Angeles, Cal.	Rev. M. J. O'Connor, S. J.	R. C.	1861	40	412	70	17,300	100,000	15,000
A	St. Vincent's College	San Francisco, Calif.	Rev. J. C. Cawell	R. C.	1861	35	368	60	1,900	28,000	0
A	St. Vincent's College	San Francisco, Calif.	Rev. J. C. Cawell	R. C.	1861	35	368	60	1,900	28,000	0
A	St. Vincent's College	San Francisco, Calif.	Rev. J. C. Cawell	R. C.	1861	35	368	60	1,900	28,000	0

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NAME	LOCATION	PRESIDENT.	Organized	Officers of Institution.	Students.	'01 of engine Ex.	Bonded Vol.	Value of Buildings.	Amount of Funds.
W. A. W. ...	W. A. W. ...	Wm. S. Reese, Ph M	1805	P	166	30	2,700	\$ 25,000	4,900
W. A. W. ...	W. A. W. ...	J. J. Rice (act)	1853	P	100	50	6,000	35,000	200,710
W. A. W. ...	W. A. W. ...	R. G. Ferguson, Ph D	1852	11	231	96	9,900	35,000	200,710
W. A. W. ...	W. A. W. ...	J. H. Raymond, Ph D	1857	45	800	0	11,000	250,000	111,750
W. A. W. ...	W. A. W. ...	J. A. Blanchard, Ph D	1860	18	321	96	2,500	185,000	40,000
W. A. W. ...	W. A. W. ...	Rev. S. B. L. Yocum, A B	1850	50	209	60	5,000	25,000	15,000
W. A. W. ...	W. A. W. ...	Rev. Robt. Boyd, D D	1806	11	32	36	2,000	25,000	0
W. A. W. ...	W. A. W. ...	S. T. M. ...	1857	12	153	39	750	70,000	0
W. A. W. ...	W. A. W. ...	Rev. M. W. Dwyer, A M	1856	50	305	92	5,500	105,500	21,518
W. A. W. ...	W. A. W. ...	W. C. Hawley, A M	1873	15	315	104	1,000	35,000	0
W. A. W. ...	W. A. W. ...	W. C. Taylor, LL D	1844	54	223	52	4,513	250,000	100,000
W. A. W. ...	W. A. W. ...	J. P. Greene, Ph D	1853	11	171	41	1,000	125,000	43,900
W. A. W. ...	W. A. W. ...	Franklin Carter, LL D	1849	57	329	50	4,000	100,000	200,000
W. A. W. ...	W. A. W. ...	J. B. Luthark, M S	1761	92	385	113	42,850	465,300	853,381
W. A. W. ...	W. A. W. ...	S. A. Martin, D D	1872	13	111	44	3,000	15,000	0
W. A. W. ...	W. A. W. ...	C. K. Adams, LL D	1870	27	288	60	2,000	100,000	60,000
W. A. W. ...	W. A. W. ...	S. A. Adams, LL D	1840	132	1,925	201	48,500	1,500,000	538,000
W. A. W. ...	W. A. W. ...	S. A. Adams, LL D	1840	27	450	60	12,000	200,000	200,000
W. A. W. ...	W. A. W. ...	J. H. Apple, A M	1854	19	292	50	8,000	125,000	65,000
W. A. W. ...	W. A. W. ...	T. C. Mendenhall, LL D	1854	19	125	52	1,500	50,000	80,000
W. A. W. ...	W. A. W. ...	Rev. E. E. Smiley, A B	1858	28	241	125	7,000	65,000	0
W. A. W. ...	W. A. W. ...	Timothy Dwight, D D, LL D	1867	14	295	169	4,000	500,000	600,000
W. A. W. ...	W. A. W. ...	Rev. H. K. Warren, A M	1867	14	187	8	4,500	100,000	0
W. A. W. ...	W. A. W. ...	Wm. E. Schell, A M	1701	322	2,511	185	350,000	6,000,000	3,375,765
W. A. W. ...	W. A. W. ...	Yankton S D	1861	16	298	36	5,831	120,050	40,000
W. A. W. ...	W. A. W. ...	Yankton College	1860	11	194	8	500	40,000	0
W. A. W. ...	W. A. W. ...	Yankton College	1870	15	106	...	...	25,000	...
W. A. W. ...	W. A. W. ...	Yankton College	1864	10	90	...	...	40,000	...
W. A. W. ...	W. A. W. ...	Yankton College	1886	9	385	16	...	95,000	...

* Co-educational in graduate courses only.

† To residents.

‡ To non-residents.

UNIVERSITIES, FOREIGN. The following list, taken from the report of the United States Commissioner of Education, gives the ninety largest foreign universities, with the number of students in attendance in 1896:

Locality.	Number of students.	Locality.	Number of students.
Paris.....	11,090	Montpellier.....	1,842
Berlin.....	9,629	Brussels.....	1,816
Vienna.....	7,026	Krakow.....	1,813
Madrid.....	6,143	Tübingen.....	1,269
Naples.....	5,108	Lille.....	1,283
Moscow.....	4,461	Liege.....	1,267
Budapest.....	4,407	Salamanca.....	1,247
Munich.....	3,814	Dorpat.....	1,233
St. Petersburg.....	3,392	Havana.....	1,226
Oxford.....	3,365	Amsterdam.....	1,218
Athens.....	3,258	Christiania.....	1,150
Leipzig.....	3,126	Göttingen.....	1,149
Manchester (about).....	3,000	Manila.....	1,144
Cambridge.....	2,929	Freiburg (Baden).....	1,143
Edinburgh.....	2,850	Dublin.....	1,128
Prague (Bohemian).....	2,815	Heidelberg.....	1,115
Kijew (Kieff).....	2,565	Strassburg.....	1,098
Turin.....	2,434	Manchester (Owens College).....	1,092
Lyons.....	2,198	Warsaw.....	1,088
Bordeaux.....	2,160	Montreal.....	1,082
Helsingfors.....	2,015	Erlangen.....	1,076
Copenhagen.....	2,000	Urbana.....	1,075
Glasgow.....	1,924	Pisa.....	1,066
Rome (Royal University).....	1,914	Rome (University Pont.).....	1,033
Barcelona.....	1,887	Nancy.....	1,018
Toulouse.....	1,808	Genoa.....	1,010
Graz.....	1,761	Innsbruck.....	1,009
Bonn.....	1,726	Santiago (Chile).....	1,000
Bucharest.....	1,680	Poitiers.....	957
Louvain.....	1,669	Marburg.....	908
Halle.....	1,645	Catania.....	902
Bologna.....	1,629	Geneva.....	862
Tokyo.....	1,620	Kasan.....	857
Padua.....	1,616	Leiden.....	816
Charkow.....	1,576	Zürich.....	814
Upsala.....	1,499	Greifswald.....	813
Rennes.....	1,477	Aberdeen.....	789
Würzburg.....	1,467	Jena.....	758
Coimbra.....	1,429	Berne.....	755
Breslau.....	1,424	Aix-en-Provence.....	748
Prague (German).....	1,424	Utrecht.....	732
Lemberg.....	1,398	Kiel.....	727
Toronto.....	1,353	Caen.....	726
Pavia.....	1,345	Klausenburg.....	726
Palermo.....	1,343	Valencia.....	726

UPHAM, COLONEL JOHN J., died in Milwaukee, Wisconsin, October 21, 1898. He was born in Delaware, July 25, 1837; was graduated at West Point in 1859; served in the Civil War in the peninsula campaign in Virginia and participated in the battles of Malvern Hill and Gettysburg and in the siege of Yorktown. He was retired in 1892.

URAL MOUNTAINS. See IRON AND STEEL.

URANIUM RADIATIONS. See PHYSICS (paragraph Becquerel Rays).

URUGUAY, the smallest republic of South America, comprises nineteen departments, whose aggregate area is estimated at 72,110 square miles, and whose total estimated population (1896) is 843,408. Seventy per cent. of the inhabitants are native born. The capital, Montevideo, has a population of about 243,000. Of the departments, Montevideo is the smallest and the most populous (area, 256 square miles; population about 270,000); the largest department is Tacuarimbó (area, 8,074); this has the smallest population per square mile (3.4); the average population per square mile for the entire country is 11.7. The number of immigrants in 1873 was 243,391; the average number a year from 1892 to 1896 was about 10,000; about half of these, or 5,000 a year, are Italians.

Government.—By the Constitution of Uruguay, which was framed in 1830, the executive authority is vested in a president, elected for four years, who exercises his functions through a ministry comprising the five departments of the Interior, Instruction and Public Works, Foreign Affairs, Finance, War and Marine. The President is Don Juan Lindolfo Cuestas. (See paragraph on History.) The legislative power devolves upon a parliament of two houses, the Senate and the Chamber of Representatives, which convene annually from February 15 to June 15.

During the rest of the year legislative power is assumed by a permanent committee, consisting of two senators and five representatives. Each department is represented in the parliament by one senator, who is elected for six years by an electoral college, the members of which are chosen by popular vote. There are about seventy representatives, elected for three years, in the proportion of one to each 3,000 male adults able to read and write.

Finance.—Revenues and expenditures of Uruguay in pesos have been for fiscal years as follows (on October 1, 1898, the Director of the United States Mint estimated the value of the peso at \$1.034 United States gold) :

	1892	1893	1894	1895	1896	Estimated. 1897
Revenue	14,035,821	17,348,130	14,570,555	15,347,062	.....	15,924,820
Expenditure ..	.....	15,024,334	.....	15,982,150	14,375,078	15,885,605

The capital has its own budget and is not included in these estimates. It was proposed that the budget for 1898 be the same as that for the previous year; the expenditure for the fiscal year 1899 is estimated, according to a report of the United States consul at Montevideo, at \$15,434,003. The following have been the customs receipts in pesos for fiscal years: 1895, 10,106,806; 1896, 10,657,133; 1897, 9,012,307. It will be noticed that the receipts for 1897 as compared with those of 1896 show a serious falling off. The public debt of the country, according to the *Statesman's Year Book* for 1898, including the service of the debt, is £26,402,870 (\$128,638,477); according to a consular report, the public debt, bonded and floating, on August 31, 1898, amounted to \$140,000,000. At the same time, the city of Montevideo was said to have bonds outstanding to the amount of \$6,000,000; as an asset, however, the city holds the electric-light plant, which yields a good revenue; the revenue of the municipality for the fiscal year, 1894, was estimated at 894,680 pesos, and the expenditure at 931,627 pesos.

Army and Navy.—The peace footing consists of four battalions of infantry, four regiments of cavalry and one of artillery, numbering 3,455 officers and men. There are 3,200 armed police and a militia of about 20,000. Three gunboats and one small steamer comprise the navy. The appropriation for the Department of War and Marine for the fiscal year 1899 was \$1,921,953.

Industries and Commerce.—The country is fertile, the surface undulating rather than mountainous, and the agricultural products belong to both the torrid and the temperate zones; during the last few years more attention has been given to agriculture, and very good results have been obtained in the cultivation of grain and fruits. The most important industry of the country, however, is cattle and sheep raising; the country, indeed, has been called one great pasture land. The statistics of 1895, which are probably somewhat less than they should be, are as follows: Cattle, 5,247,871; horses, 388,343; mules, 14,087; sheep, 14,333,626; the total value of the flocks and herds being \$73,038,000. From this industry arises the greater part of the export trade, great quantities of jerked beef, hides, skins, tallow, and wool being sent from the country each year. The wool export in 1895 amounted to 50,000 tons. The exports of wheat, flour, and corn to the United States for the three years preceding 1898 were as follows:

Year.	Wheat.	Flour.	Corn.
1895	2,079,761	681,744	797,761
1896	161,112	733,282	866,869
1897	392,637	612,356	34,565

It is said that foreign commerce suffered severely in 1897 on account of the locust plague and the political troubles and revolution, but in 1898 the foreign trade seemed to be on the gain. For the four years commencing with 1894 the total agricultural exports were valued at \$10,902,823, for the four years preceding they were valued at \$2,246,855. The trade with the United States for the year ending June 30, 1898, was as follows: For the last six months of 1897 the exports amounted to \$830,948, the imports, \$606,665; for the first six months of 1898, imports, \$655,419; exports, \$1,323,650. For the first six months of 1898 the general customs receipts, according to the *Montevideo Times*, were \$5,319,448; the receipts for the corresponding months in 1897 were \$4,290,121, and in 1896, \$5,535,402. The figures given by the *Times* for 1898 were subject to revision, which it was stated would increase rather than diminish them. The chief imports are foods and drinks, raw materials and machinery and textiles; imports have been valued in pesos as follows: 1894, 23,800,370; 1895, 25,386,106; 1896, 25,530,184. The exports for the same fiscal years were respectively valued in pesos as follows: 33,479,511, 32,543,644, 30,403,083. Among the minerals found are gold, silver, mercury, tin, copper, lead, magnesium, and lignite coal; the mining industry, however, has not progressed.

Communications and Shipping.—In 1896 there had been 1,206 miles of railway

opened for traffic and about 200 miles were in process of construction. Besides the Central Railroad, with its north, northeast, and east extensions, there were in 1898 eight railroads in Uruguay aggregating about 2,183 miles; the capital stock is \$92,968,190. These roads range from one of three kilometers in length, with a capital stock of \$73,000, to the Interior Railroad, 617 kilometres in length, with a capital of \$15,000,000. There are 89 miles of tramway. In 1897 the telegraph lines amounted in length to 4,380 miles, 982 of which belonged to the railroads; there were 97 telegraph offices.

In 1895 the merchant marine consisted of 19 steam vessels with a total of 4,608 net tons, and 45 sailing vessels with a total net tonnage of 13,171. In 1896 there entered at Montevideo from foreign ports 1,263 seagoing vessels with a total tonnage of 1,991,554, and there cleared 1,153 vessels, aggregating 1,942,861 tons. In the river and coasting trade there entered 2,699 vessels with a total of 701,588 tons, and cleared 2,677 vessels of 691,485 tons.

Religion and Education.—The state religion is Roman Catholic, but others are tolerated. In the early part of 1898 the State Department at Washington received a report from United States Consul Swalm, from which the following facts were obtained. Besides the 379 private schools in Uruguay there were 533 public schools, of which 181 were in the cities and towns and the remainder in the country districts. The average term was nine months, and the average attendance, according to the report, was nine per cent. of the population, which, although small, was said to be the highest percentage in South America. The number of pupils in the public schools was 51,312 and in the private schools, 22,689, while the average cost per scholar in the public schools was 12.38 pesos, gold. About two-thirds of the teachers employed are women; the whole number of teachers in the public schools in 1896 was 1,990, all but 606 of whom were natives. The average salary of teachers is about \$35.50. There are two successful normal schools, one for men and one for women; also a university, under control of the government, having departments of arts, law, medicine, and engineering. It is said that the courses of instruction here are very good, and the attendance is encouraging. The state supports a school of arts and trades, which has about 250 students, and a military college, where there are about 50 students. The number of students in the University is about 550. In secondary education modern methods are used, but the high-school system is not known. There is a national museum and a national library of over 22,000 volumes and more than 2,500 manuscripts. Seventy-three periodicals are published; of these 68 are in Spanish, 3 in English, and one each in French and Italian.

History.—In the early part of 1897 a revolution was attempted by the Blanco party in Uruguay. By the end of June the government declared that the insurrection was suppressed; but about the middle of the next month the leaders of the Blanco party, though negotiating for terms of peace, were, in fact, dictating them. An armistice was concluded to extend to August 5, and President J. Idiarte Borda arranged terms of peace with the insurgents, by which they were given the leadership in several departments of the government, the officers were restored to their former rank, and the exiles permitted to return home. The Chamber of Deputies, however, rejected this treaty, and both parties again prepared for conflict. On August 25 the President, who had been elected in March, 1894, while engaged in the celebration of a national holiday commemorative of the nation's independence, was shot and killed by one Avelino Arredondo, who, since he belonged to the Colorado party, which antagonized the Blancos, doubtless committed the deed because of personal motives. Señor José Cuestas became acting President and instituted vigorous measures to quell the rebellion. He summoned a new cabinet, which seemed disposed to compromise the matter with the insurgents; at any rate, on September 10 the Administration announced that a treaty of peace had been signed, and it received unanimous ratification by both houses of the legislature. The terms of this treaty were not made public until January, 1898. According to it, the Blancos agreed to disband and the executive power was placed in control of the president of the Senate, electoral reform was agreed upon, and pardon granted to all who had taken part in the insurrection, while the leaders were restored to their former rank. The new Administration then set to work to bring about various needed reforms. Many unnecessary offices were abolished, frauds in various departments were discovered and punished, and a number of foreign ministries, which were considered to be unnecessary, were discontinued. The country was beginning to enjoy evident prosperity when, on November 19, a plot was discovered against Señor Cuestas, which had been planned by Dr. Julio Herrera y Obes, who had been one of the chief followers of President Borda. The plot was frustrated, martial law was proclaimed, and Señor Herrera was restrained and about thirty members of his party were imprisoned or exiled. But early in 1898 Señor Herrera, who had resumed the leadership of his party, was making active preparations to carry the election, which was to take place

March 1, against the party of the President. It was easily seen that Señor Herrera had determined to become practically the chief executive himself, since the candidate of his party, Dr. Tomas Gomensoro, was a man eighty-eight years old; success to Herrera's party would have been unfortunate for the government, because he was recognized as a man of the most unscrupulous political principles. When in February it seemed likely that this party was to win at the polls, acting President Cuestas, on the 10th of the month, by an unexpected *coup d'état*, dissolved the houses of the legislature and proclaimed himself "provisional president." He issued a decree in which he appointed a Council of State, consisting of eighty-eight persons from all parties, to take the place of the houses just dissolved. In this dictatorial step Señor Cuestas was supported by the younger political element and by men of business. The Council was given constitutional functions of legislative power and was privileged to select another provisional president in case of vacancy. Along with the decree Señor Cuestas announced that the revenue was sufficient for carrying on the government, and that, relieved from financial difficulty, he hoped to give more attention to public works. Public opinion seemed to support the President, for his decree met with no opposition, and on February 17 a great public demonstration was made by which he was assured of the confidence of the people. That the public was sincere seems to be supported by the fact of a decided rise in the stock market. The Council of State assumed its duties on February 12, and immediately set to work further to curtail expenses. Uruguay again seemed to be in sight of prosperity, for the spring crops of wheat and wool were said to be of unusual size; an estimated value of \$12,000,000 was placed upon the wheat alone.

UTAH, a Western State of the United States, has an area of 84,970 square miles. Capital, Salt Lake City.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 160,113 bushels, value, \$101,468; wheat, 5,105,184, \$2,756,799; oats, 969,950, \$368,581; barley, 208,088, \$97,801; rye, 67,996, \$31,278; potatoes, 700,245, \$217,076; hay, 613,213 tons, value, \$2,759,458; and cotton (season of 1897-98), 60 bales, value, \$1,734—total value, \$6,334,195. Live stock comprised: horses, 68,295; mules, 1,599; milch cows, 57,787; other cattle, 303,116; sheep, 2,116,949; and swine, 47,808—total head, 2,595,554. Sheep-raising has been greatly stimulated by the tariff on wool, and herds of cattle have greatly increased.

Mining.—Silver continues to be the most valuable mineral production. The yield in 1897 was 6,265,600 fine ounces, coining value, \$8,100,978, a decrease in a year of 2,562,000 ounces. Local reports gave the yield of 1898 as 7,547,722 ounces. Gold in 1897 had a product of 83,500 fine ounces, worth \$1,726,100, showing a decrease of 8,408 ounces, and the Mint estimate for 1898 was in value \$2,170,543. Copper reached its highest production on record, with 3,919,010 pounds, and, according to local reports, this record was surpassed in 1898, with an output of 5,333,638 pounds. Lead yielded 81,074,000 pounds in 1897 and 90,346,100 in 1898. Utah and Colorado together produced 3,700 short tons of asphaltum, valued at \$47,500, in 1897, the States being reported together because of lapping deposits. Coal mining yielded 521,560 short tons, spot value, \$618,230, an increase of nearly 25 per cent. over the product of 1896, and the highest production on record. Limestone, sandstone and granite were quarried to the value of \$21,011, and the clay industry yielded \$136,981, nearly all brick and tile. See ASPHALTUM and LITHOGRAPHIC LIMESTONE.

Transportation.—On January 1, 1898, the length of all railroads in the State was reported at 1,436.22 miles, with no new construction in the previous year. During 1897 a number of important changes were made in local railroad management which promised material advantage to the State.

Banks.—On October 31, 1898, there were 11 national banks in operation and 6 in liquidation. The active capital aggregated \$1,650,000; circulation, \$764,524; deposits, \$4,016,406; reserve, \$1,422,834. The State banks, June 30, 1898, numbered 9, with capital, \$666,800; deposits, \$3,305,108; resources, \$4,132,152; and stock savings banks, 8, with capital, \$725,000; deposits, \$1,447,409; resources, \$2,770,103. The exchanges at the United States Clearing House at Salt Lake City, in the year ending September 30, 1898, aggregated \$85,755,274, an increase of \$13,558,748 in a year.

Education.—At the end of the school year 1896-97 the school population was 81,882; public school enrollment, 69,228, and attendance, 48,315. There were 942 public school-houses; 1,177 teachers; public school property valued at \$2,524,989; and expenditures, \$905,713, including \$514,573 for teachers' salaries. Institutions for higher education comprised 2 public high schools, 13 private secondary schools, a private normal school, 2 colleges, with 36 professors and instructors, 578 students, and \$82,555 income; and an agricultural college at Logan. During 1897 work was begun on a new building for Brigham Young College at Logan, and on a branch normal school at Cedar City. Periodicals in 1898 numbered 74; dailies, 7; weeklies, 49; monthlies, 8.

Finances.—The real value of all assessable property in 1897 was estimated at \$250,000,000 and assessed at \$102,437,183, an increase in a year of nearly \$5,000,000. The bonded debt, September 1, 1898, was \$900,000.

Population.—Territorial census 1895, 247,324; Federal estimate 1898, 275,000. Local census and estimates gave Salt Lake county 68,182; Utah, 29,229; Weber, 25,015; Cache, 18,286; Sanpete, 15,538; Summit, 9,631; Boxelder, 8,831; Sevier, 7,893; Davis, 7,480; Juab, 6,466; Millard, 5,375; all others below 5,000; and cities and towns, Ogden, 19,800; Provo City, 6,700; Park City, 4,000; Brigham, 3,107; Ephraim, 3,000.

Supreme Court Decision.—Upon its admission into the Union in 1896, the constitution of Utah contained an article dealing explicitly with the rights of labor. A case involving this question was carried to the United States Supreme Court, which, in 1898, sustained the statute making eight hours a legal working day in mines and smelters, thus establishing the rights of States to regulate the relations of employes to their work.

Elections and Politics.—The Republicans gained fourteen seats in the State legislature, which is now composed of 41 Democrats, 16 Republicans and 6 Fusionists. The Democrats elected their candidate for representative in Congress and for judge of the State Supreme Court. The utterances of the State conventions were as follows: Republican—"While we insist on maintaining the Monroe Doctrine in all its integrity, we believe it consistent with it and safe for us to hold and maintain possession for commercial purposes of other lands in any part of the world, and we believe in protecting our flag wherever it has been successfully raised." Democratic—"The war with Spain was necessary and inevitable if the nation was to have any regard for the protection of its citizens and the redress of wrongs and outrages on the part of Spain, which had become intolerable. Every consideration of justice and humanity demanded quick and decisive action. Such was the demand of the American people. Yet, after this condition became known for months, a Republican administration hesitated, and in weakness sought to avoid the responsibility growing out of this most important crisis. After resorting to various devices and deceptive representations it was at length compelled, through the patriotic efforts of the Democratic members of Congress and an array of public sentiment, to favor a declaration of war. Through the skill, willingness, sacrifice and heroism of the army and navy of the United States the war has been waged to a triumphant and glorious conclusion." The Democratic convention demanded that all Federal taxation should be strictly and only for revenue for the support of an economically administered government; the Republican party, on the other hand, demanded "protection, bimetallism and reciprocity," and congratulating Utah on the great financial success of the Republican doctrine of protection as expressed and fulfilled in the Dingley act, claimed that Utah's wealth had been greatly increased by it, that lead-mining had been sustained, and that the agricultural productions were more profitable. The Republican party reaffirmed its allegiance "to the cause of the free coinage of silver at the ratio of 16 to 1, independent of the action of any other nation." The Democrats reaffirmed their principles declared in the Democratic platform adopted in Chicago for 1896—viz., "the enactment of a law by the Congress of the United States providing for the free and unlimited coinage of both gold and silver at the ratio of 16 to 1, without waiting for the aid or consent of other nations, such consent being notoriously impossible to obtain; and that such coin be legal tender in payment of all debts, both public and private."

The Peoples' party demanded "a law opening the mints to the free and unlimited coinage of gold and silver at the present ratio of 16 to 1," and also "that the money of this country be speedily increased by the issuing of legal-tender notes to an amount sufficient to transact the business of the country upon a cash basis, and that all money, gold, silver or paper, be made a full legal tender for all debts, thereby making "every dollar as good as every other dollar."

The legislature enacted a law enabling soldiers in the field to vote.

The Election of B. H. Roberts.—The solemn repudiation of polygamy was the condition upon which this State was admitted into the Union. It was known, however, that the practice was still maintained among some of the Mormons (q. v. and see WOODRUFF, WILFORD), and the election of Mr. B. H. Roberts as Democratic Representative to Congress brought the question again to the front, since he is an avowed polygamist. Resolutions and petitions from State legislatures, societies and associations of all kinds have been sent to Congress praying that body to unseat Mr. Roberts. Women's associations have been especially active and aggressive in the matter.

National Representatives and State Officers.—Utah elected as representative in Congress B. H. Roberts (Dem.), from Centreville; Senators, Joseph L. Rawlins (Dem.), Salt Lake City, and another Democrat. The State officers are: Heber M. Wells, Governor; J. T. Hammond, Secretary; A. C. Bishop, Attorney-General;

M. Richards, Jr., Auditor; James Chapman, Treasurer, and J. R. Parks. Superintendent of Public Instruction. Chief Justice, George W. Barch (Rep.); Associates, J. A. Miner (Rep.) and R. N. Baskin (Dem.); Clerk, L. P. Palmer (Rep.).

VACANT LOT CULTIVATION. This is a movement to make use of the vacant lots in cities for the purpose of aiding the unemployed. The name of Mayor Pingree, of Detroit, Mich., is associated with the foundation of this scheme, which is sometimes known as the Pingree Potato Patch Plan. It was taken up in Detroit as a municipal enterprise to relieve the unemployed, the number of whom had been greatly increased as a result of the hard times of the winter of 1893 and 1894. It was managed by the Agricultural Committee appointed by the Mayor, and during 1894, 1895 and 1896 small sums were raised by subscription or appropriated by the Common Council for the purpose of carrying on the work. In 1896 the Agricultural Committee reported that in the three years 1894, 1895 and 1896 the net profit was \$61,896, and the city was saved that amount of taxation.

In Buffalo the work was also placed under municipal control. In 1895 the Mayor put the plan in operation, forming for the purpose the Buffalo Industrial Association. Its effect was very beneficial, and resulted in a falling off in the demands for public relief. In 1896 and 1897 a State council appropriated \$3,500 and \$3,000 respectively, and with this comparatively small outlay secured sufficient profits to pay for the employment of a large number of persons. It was estimated in 1897 that at least 10,590 persons were relieved and that the city was saved about \$30,000. A certain contract price of \$2.85 per acre was established for plowing and 700 acres of land were covered. For the harrowing, rolling and staking of the land 35 cents an hour was paid. In Boston the city has rented all the land used. The records of the work for three years show that the amount realized was nearly double the amount expended, and that in 1896 the net yield of the land per worker was about \$20.33. There was a small crop of potatoes in 1897, but the enhanced price nearly offset this. In Brooklyn the experiment has also been tried. At first it was not wholly satisfactory, for comparatively few persons applied for the work and the expense of superintendence was proportionately high. The elevated railroads of Brooklyn aided the movement by granting the workers free transportation to and from the gardens. The financial result of the experiment in Denver was very successful, the estimated value of the crops was from six to nine times the amount expended, but this estimate is perhaps exaggerated, because materials or tools were probably contributed without taking any account of their value. At Seattle, Wash., good results were also obtained.

It was started in New York City in 1895, and was there organized by the Association for Improving the Condition of the Poor. Careful statistics were taken of the social condition of the applicants and the records were kept on file. During the first two years the returns amounted to double and even three times the expense, and this notwithstanding that the applicants had very little preparation for the work. In Rochester, N. Y., the work was also begun in 1895, and it was there under the direction of the Overseer of the Poor. The lots were rented by their owners in the suburbs. Wages were paid, but hardly more than two days' work was allowed to each man. The scheme did not work in a very satisfactory way, but it was not carried out on the principle of the original plan, being rather a method of furnishing subsidiary employment or distributing outdoor relief. In Philadelphia, Chicago, Dayton, O., Providence, R. I., and Kansas City favorable reports were received both for 1896 and for 1897.

In Chicago an outcome of the plan has been the formation of a regular society, known as the People's Friendly Club, composed of the workers in these vegetable gardens. This club holds regular meetings, in which social questions are discussed. At Dayton, O., the work was begun by the Associated Charities and the Single Tax Club, and resulted in a financial success. In Kansas City, where the work was begun by the Agricultural Commission in 1897, a great variety of crops was harvested, potatoes, beets, beans and cabbage being among the most important. At Reading, Pa., the work was begun by a Citizens' Committee appointed by the Mayor. The experiment was not tried on a large scale, but in spite of the late beginning and the extreme drought its result was successful.

The above brief description of the movement is based on the report of the committee of the Philadelphia Vacant Lots Cultivation Association, which was published early in the year 1898. The general conclusions from the committee's investigations indicate, of course, that the plan has been on the whole financially successful, the degree of success depending largely upon the promptness with which the work was begun in the different localities. In many cases the raising of funds and the practical organization of the work took so long a time that the season was too far advanced for the best results to be secured. An examination of the statistics in a large number of cases shows that the gains were very high, often amounting to three or four dollars for every dollar expended. The quality of the crops was, on the

whole, excellent, and for this reason the gardeners were able to command the highest market prices. In some cases prizes were offered for the best crops in order to stimulate the work.

VACCINATION. An English medical periodical sums up important statistics respecting vaccination, as follows:

"Condomine records that smallpox destroyed, maimed and disfigured a fourth part of mankind. One boy in nine and one girl in ten died from smallpox. In Europe on an average 2,000 deaths from smallpox occurred to every million living. Six millions out of every twelve died in North America and two-thirds of the population of Greenland. Before the era of vaccination the death-rate from smallpox was about the same in Sweden, England, Prussia, Austria and Belgium, the average being about 2,000 per million. On the introduction of optional vaccination mortality dropped everywhere to about 400 per million. When compulsory vaccination was adopted in Prussia, England and Sweden the mortality was reduced from 20 to 40 per million. Austria and Belgium retained the old optional system, retaining also the old mortality statistics.

"The following statistics by Dr. Abbott are of much interest:

	Unvaccinated.	Vaccinated.
From 1816-41.....	16 per cent.	1 per cent.
London, Smallpox Hospital, 1836-56.....	35 per cent.	7 per cent.
Vienna, 1837-57.....	30 per cent.	5 per cent.
Bohemia, 1835-55.....	29 per cent.	5 per cent.

"Dr. Barry, in his records of the Sheffield epidemic of 1887-88, says: 'Out of every hundred deaths in the unvaccinated, 44 were under 10 years of age, and 56 over 10; out of every 100 deaths in the vaccinated, only three were under 10 years and 97 over.'

"To establish a relation between the number of vaccination marks and pitting from smallpox, Dr. Buchannon, in 1863, examined 50,000 school children, finding as a result that those with four or more vaccination marks were pitted to the extent of .67 per 1,000; three marks, 1.42 per 1,000; two marks, 2.49 per 1,000; one mark, 6.8 per 1,000; those having no marks, 360 per 1,000.

"In the Metropolitan Board Smallpox Hospitals 655 nurses were admitted. With the exception of ten of these all had been vaccinated, the result being that the disease passed over all of the 645 who were protected by vaccination and seized on the unprotected ten.

"That these figures are not due to improved methods of sanitation in the great cities may be judged from the following facts: Smallpox has declined 72 per cent.; measles only 9 per cent.; whooping-cough only 1 per cent.; scarlet-fever not at all. Since the last century the total decline in the rate of deaths from smallpox is 90 per cent. Referring to the countries where vaccination is not compulsory, the average mortality in Austria is as high as it was fifty years ago; Belgium about the same; in some parts of Spain scarcely less than what it was 200 years ago."

Since 1875 Germany has vaccinated every infant and revaccinated every child before it has reached the age of thirteen years. Gerhardt declared in 1896 that, as a result, smallpox had almost died out in Prussia.

In the face of all this and similar testimony, found all over Europe, England in 1898 removed the safeguard. The anti-vaccination sentiment in England has become so strong, although confined to a small class, that a measure has been adopted practically annulling the compulsory vaccination bill of that country. The new measure provides that any parent may refuse to have his child vaccinated and avoid legal penalty, if he satisfies the court that he has conscientious scruples as to the benefits of vaccination.

VAIL, REV. ALBERT D., D.D., pastor of the Park Avenue Methodist Episcopal Church, New York City, died November 22, 1898. He was born at Verbank, New York, January 1, 1835; was graduated at Wesleyan, Middletown, Connecticut, in 1848. He was a frequent contributor to religious periodicals and conducted the Sunday-school department of the *Christian Advocate*.

VAN DYCK, ERNEST, opera singer, was born in Antwerp in 1861. He abandoned law for music, and went to Paris in 1882 to study singing under Bax St. Yves. At Massenet's request he took the tenor's part in *The Gladiator*, in Paris, at short notice, and made his début with great success. He sang in *Lohengrin* when that opera was first given in Paris (1887), and studied German in order to sing Wagner in the original. His first Bayreuth appearance was as "Parsifal" in 1888. He again sang this rôle in 1889, 1891, 1892 and 1894. In the latter year he sang *Lohengrin* at Bayreuth. He sang "Loge," one of his greatest parts, at the *Ring* in London in 1898. Mr. Van Dyck's first American appearance was made in 1898, as "Tannhäuser."

VAN DYKE, HENRY, author, was born in Germantown, Pa., November 10, 1852. He was educated at Princeton and at the University of Berlin, and received his D.D. from Princeton, Harvard and Yale. Union gave him LL.D. in 1898. He has held pastorates over the United Congregational Church, in Newport, R. I.; Harvard, and the Brick Presbyterian Church, New York. In 1898 he was made professor of English literature at Princeton. His publications include: *The Poetry of Tennyson* (1889, 10th edition, 1898); *The Christ-Child in Art* (1894); *The Lost Word* (1898). He has also written *The Builders, and Other Poems* (1897), and many religious books.

VAN HORN, JAMES J., colonel Eighth United States Infantry, died at Fort Russell, Wyoming, August 29, 1898. He was born at Mount Gilead, Ohio, February 6, 1835; was graduated at West Point in 1858, and in the Civil War served in the Peninsula and Maryland campaigns. In April, 1891, he became colonel of the Eighth Infantry, which regiment he commanded at the battle of El Caney before Santiago.

VAN INGEN, HENRY, professor of art in Vassar College, died at Poughkeepsie, November 17, 1898. He was born in Holland, November 12, 1833; he studied at the Academy of Design at The Hague, and under J. B. Tom and Van de Iande Backhuysen. He came to America about 1861, and taught for a short time in Rochester; in 1865 he became the head of the art department at Vassar, and remained in that position until the time of his death. He was a valued member of the faculty and was always identified with the growth of the college. Professor Van Ingen was a member of the Tulchri Studio, The Hague, and of the American Water-Color Society; to the exhibits of the latter he frequently contributed.

VAN ROOY, ANTON, opera singer, was born in Rotterdam in 1870. He sang in church choirs when a boy, and in 1891 went to study with Julius Stockhausen at Frankfort-on-Main. While singing in concerts in Germany he attracted the attention of Frau Wagner's daughter, and was engaged for the Bayreuth Festival of 1897, where he achieved great success as "Wotan." Mr. Van Rooy sang in the *Ring* in London in 1898, and made his first New York appearance later in the year.

VAN STRANBENZEE, BOWEN, C.M.G., British lieutenant-colonel, died in Kingston, Ontario, November 8, 1898. He was born April 29, 1829, in Yorkshire, England. He served with the Thirty-second Regiment in the Sikh wars, in which he was seriously wounded, and on the frontier of India in 1851-52; was on the staff of his brother, Sir Charles, commander of the First Brigade of the Light Division, in the Crimean War, 1855-56; served throughout the Chinese campaign of 1858-60, retiring in 1868. In 1876 he was made deputy adjutant-general of Canadian militia and commanded the infantry brigade at Batoche in the campaign against Louis Riel in 1885, after which he was made a C.M.G.

VAN WYCK, AUGUSTUS, a lawyer of Brooklyn, and brother to Mr. Robert A. Van Wyck, Mayor of New York, was born in New York City in 1846. Much of his early life was passed in the South. After his graduation from Phillips Exeter Academy, he entered the University of North Carolina, where he was graduated and received the degree of M.A.; studied law in Richmond, Virginia; and having practised there a few years came to Brooklyn, New York, where he became associated with the Democratic machine. In 1881, however, he assisted in founding the Jefferson Hall organization, but soon after was again on friendly terms with the machine, which have been maintained by him ever since. In 1884 he was elected judge of the city court; when that court was abolished, he became by virtue of Section 5, Title 6, of the Constitution, a justice of the State Supreme Court in the second judicial district of Brooklyn, the term to expire December 31, 1898. Mr. Van Wyck is a member of several well-known societies and clubs and is a communicant of the Protestant Episcopal Church. Though not especially prominent until the fall of 1898, he had been a member of the Democratic general committee and delegate to local, State and national Democratic conventions. On September 28, 1898, the Democratic State convention met at Syracuse, and the next day nominated Judge Van Wyck for governor by a vote of 350 to 41 for Mr. Robert C. Titus, 38 for Mr. John B. Stanchfield and 21 for Mr. James K. McGuire. The Democratic nomination had been a matter of much speculation; many thought that Mr. Richard Croker, the Tammany leader, would declare for the nomination of Mayor Robert A. Van Wyck; and the selection of Judge Van Wyck by Mr. Croker and the approval of the convention created a general surprise. The platform adopted was conspicuous in its avoidance of those issues which the Republicans held to be paramount, namely, national questions; it was, however, vigorous in charging the Administration with mismanagement of the war. It laid much stress on the alleged Erie Canal frauds, denounced the new law for a metropolitan election district, and asserted that the Republican gubernatorial candidate, Colonel Theodore Roosevelt (q. v.), in his declarations of his residence, had either "committed perjury," or was ineligible to the office. After his nomination Judge Van Wyck resigned his seat in the judiciary.

During the hard-fought campaign, unlike Colonel Roosevelt, whose speeches were a feature of the contest, he made few addresses, and those were usually read from manuscript. Even the most ardent Republicans did not attempt to cast aspersions upon the character of Judge Van Wyck, but the opposition was directed chiefly against the "bossism" of Mr. Croker and the many abuses that Tammany supremacy seems to mean. The election, which occurred on November 8, 1898, resulted in a plurality for Colonel Roosevelt of 18,079.

VAN WYCK, ROBERT A., Mayor of New York, was born in New York city in 1850, and is descended in the seventh generation from Cornelius Barents Van Wyck, who came to New Netherlands from Wyck, Holland, in 1650. Mr. Van Wyck's father, the late William Van Wyck, was a well-known lawyer some sixty years ago, and up to the time of his death was one of the leaders of the New York Democracy. Robert Van Wyck did not receive a broad academic education, as he left school at an early age and became an office boy; when nineteen years old, however, he was able to enter the law department of Columbia College, and was graduated three years later at the head of his class of one hundred and twenty-four, delivering the valedictory at the commencement of 1872. Mr. Van Wyck has long been prominent in the councils of Tammany Hall, but was not known to the public until 1889, when he was elected to the city court, of which, in 1897, he was chief judge. On September 30, 1897, the Tammany Democratic city convention (composed of delegates from the five boroughs of the "greater city") nominated Mr. Van Wyck for the first Mayor of New York under the new charter, which added to the old New York, or Manhattan Island, the boroughs of Brooklyn, Queens, Richmond, and the Bronx. Mr. Van Wyck's two chief opponents in the campaign were Seth Low, President of Columbia University, who was nominated by the Citizens' Union, an independent organization opposed to the "bossism" of Mr. Richard Croker and to Tammany administration, and General Benjamin F. Tracy, a well-known lawyer, ex-secretary of the navy (Harrison cabinet), and chairman of the commission which drew up the charter for the "Greater New York," who was nominated by the Republicans. Much pressure was brought to bear upon Senator T. C. Platt and other Republican machine leaders to the end that the Republican party would indorse Mr. Low, but in this they would not concur. Seemingly the greater part of the "better element" in New York favored the election of Mr. Low; the result of the election, which took place November 2, 1897, was as follows: Van Wyck, 233,997; Low, 151,540; Tracy, 101,873; Henry George, the younger (Jeffersonian Democracy), 21,693; Sanial, Socialistic Labor, 14,467. Other candidates received a comparatively insignificant number of votes. Little was said against the personal character of Mr. Van Wyck; but both in New York and throughout the country lovers of clean and honest municipal government deplored the defeat of the Citizens' Union ticket. The result was rendered still further regrettable by the fact that had the Republican managers consented to combine with the Citizens' Union, Mr. Low would probably have been elected by a plurality of about 21,000. On January 1, 1898, Mr. Van Wyck was installed as mayor, and the government of the greater municipality was inaugurated.

VARIABLE STARS. See ASTRONOMICAL PROGRESS.

VARIATION OF LATITUDE. See ASTRONOMICAL PROGRESS.

VASSAR COLLEGE, near Poughkeepsie, New York, is non-sectarian and for women only. It was incorporated in 1861 as Vassar Female College, this being changed to its present name in 1867. There is one course of study, leading to the degree of Bachelor of Arts; for the attainment of this degree Greek is not required. In the sophomore year six hours of recitation work a week are elective, and in the last two years all but three hours are elective. For the year 1898-99 there were 57 officers of instruction; the student enrollment was: Graduate students, 11; seniors, 114; juniors, 126; sophomores, 171; freshmen, 173; special students, 24; total, 619. The class of 1898, the members of which received the baccalaureate degree in June, numbered 86. The president is Rev. James M. Taylor. See UNIVERSITIES AND COLLEGES.

VEAZEY, WHELOCK GRAVES, soldier and lawyer, died in Washington, D. C., March 22, 1898. He was born in Brentwood, New Hampshire, December 5, 1835; was educated at Phillips Academy, Exeter, Dartmouth College, being graduated in 1859, and the Albany Law School, and was admitted to the bar in Vermont in 1860. He entered the Union service, becoming a colonel in the fall of 1862, and the next year was mustered out with his regiment, and resumed the practice of law in Rutland. He had served under McClellan throughout the Peninsula campaign before Richmond, and his regiment was prominent at Gettysburg. Colonel Veazey was Supreme Court reporter for Vermont from 1864 to 1872; in the latter year he was sent to the State Senate; was delegate-at-large to the Republican national convention of 1876; was judge of the Supreme Court, 1879-89, during which time he served as a commissioner for revising the statutes of the State. In September, 1889, President

Harrison appointed him a member of the Interstate Commerce Commission. He was prominent in the Grand Army of the Republic, being elected commander-in-chief in 1890. In 1886 Dartmouth conferred on him the degree of LL.D.

VEGETABLE CHEMISTRY. See BOTANY (paragraphs Plant Physiology and Cytology).

VEGETABLE PHYSIOLOGY. See BOTANY (paragraph Plant Physiology).

VENEZUELA, a republic of northern South America, which previous to 1881 consisted of twenty-one States and their territories, is now divided into eight States, a federal district, two national settlements, and eight territories. Its estimated area of 593,943 square miles includes the territory claimed by Great Britain as belonging to British Guiana, and the disposition of which has been submitted to arbitration. According to the census of 1891, the population was 2,323,527, there being 1,137,139 males and 1,186,388 females. In 1881 the inhabitants numbered 2,075,245, and in 1873, 1,784,193. The native Indian population in 1890 numbered 326,000, of whom 240,000 were said to be civilized. The capital is Caracas (population in 1891, 72,429); other cities of importance are Valencia (38,654), Maracaibo (34,284), Barquisimeto (31,476), Barcelone (12,785), Ciudad de Cura (12,198), Ciudad Bolivar (11,686), Guanare (10,880). The eight states are as follows: Bermudez, Bolivar, Carabobo, Falcon and Zulia, Lara, Los Andes, Miranda, Zamora; of these Carabobo is the smallest in area (2,984 square miles), and Bolivar has the largest area (88,701) and the fewest inhabitants (50,289). The territories are: Alto Orinoco, Amazonas, Armisticio, Caura, Colon, Delta, Goajira, Yuruari; of these Alto Orinoco is the largest (119,780 square miles) and Colon the smallest (166). Inhabitants are very few in all of them except Goajira, where the population per square mile is 18.3.

Government.—The chief executive authority is a president, who is elected for a term of two years, and is assisted by six ministers, chosen by himself, and a federal council, consisting of nineteen members appointed biennially by Congress. Neither members of the Council nor the President can be re-elected, and the latter has no veto power. The legislative power is vested in a congress of two houses, the Senate and the House of Representatives, the former consisting of twenty-four members, three being chosen by the legislature of each state, and the latter consisting of fifty-two members, chosen by popular vote, the ratio being one for each 35,000. The congresses of the several states are also elected by popular vote. Besides district and municipal judges and special lower courts, there is a Supreme Federal Court and a Supreme Court of Appeal.

Finance.—Revenue and expenditure in bolivars for fiscal years ending June 30:

	1893-94	1894-95	1895-96	Estimated. 1896-97
Revenue.....	51,421,875	48,656,797	51,459,947	40,300,000
Expenditure.....	51,919,795	43,891,525	65,959,787	40,300,000

Customs constitute the principal source of revenue, amounting in 1896-97 to 27,000,000 bolivars; the chief expenditures are for administration, service of internal and external debt, and railway debt. The total foreign debt, including arrears of interest and a loan of 50,000,000 bolivars (£1,980,118), on July 1, 1897, amounted to £4,621,318. In the preceding December the internal debt was 82,897,291 bolivars. In order to unify the internal debt there were issued (April, 1896) bonds amounting to 65,000,000 bolivars, known as the National Internal Consolidated Debt. More recently the foreign debt, exclusive of the loan of 50,000,000 bolivars, has been reported at £2,709,435.

Army and Navy.—The army in 1895 was divided into eleven battalions, aggregating about 4,000 men, who were stationed in federal garrisons and ships and in twenty towns of the country. There is also a national militia, which in times of civil war has been increased to 60,000 men. According to the law of 1889, the number able to bear arms is 250,000. A later report places the size of the regular army at about 7,280. The navy consists of three steamers and two sailing vessels.

Industries.—The internal resources of Venezuela are very great and the principal industries are agriculture and cattle-raising. Much land is without private or corporate owners, and is managed by federal authority, but vast areas of fertile soil are still uncultivated. Almost all kinds of tropical products can be cultivated successfully, the most important being coffee, cocoa, hides and skins, rubber, tonka beans, dyewoods, Peruvian bark, sugar, copaiba, vanilla. The chief of these is coffee, and on account of the failure of this crop in 1897 the general condition of trade was very unsatisfactory, but conditions improved with the crop of the following year. There are in the country about 33,000 coffee estates, aggregating about 200,000 acres, under cultivation, from which, it is reported, there is an average annual export of about 49,000 tons. The cocoa estates number about 5,000 and the sugar-cane about 11,000. In regard to the herds of the country, Mr. Frank B. Loomis, the American Minister

at Caracas, said in a report, November, 1897: "The cattle industry of Venezuela is one that may become of enough importance at any time to constitute a menace to the American cattle trade. . . . The cattle industry is in its infancy here and there is excellent reason to think that it is capable of enormous development. The lands capable of furnishing good grazing are vast in extent." In 1895 the number of cattle was estimated at from 4,000,000 to 5,000,000.

Among the many minerals found in, Venezuela are gold, silver, copper, salt, asphalt, petroleum and trona; coal also has recently been found. It is said that from the 226 mines in the country 42 different metals may be obtained; mining, however, has not become of great importance. Gold is found chiefly in the Yuruari territory. The output from this district, which in 1884 was 233,935 ounces, decreased until in 1892 it was 46,560 ounces; it then increased, the output for 1896 being 60,674 ounces. Silver is found in Bermudez, Lara and Los Andes. The salt mines, which are under governmental control, produced a revenue, 1893-94, of 1,727,490 bolivars. The principal supply of the coal of Northern South America comes from Cardiff, Wales, and the retail price per long ton is from \$11.20 to \$12.80. These high prices have proved to be a stimulus toward the investigation of the coal and lignite deposits of Venezuela and Colombia. Numerous deposits were found both of coal and asphalt, but most of them were small and not of excellent quality. It was the opinion of the mining expert that although the mining of asphalt and to some extent that of coal might become important industries in Venezuela and Colombia, the importation of coal would nevertheless be a permanent necessity. It was reported in 1898 that immense deposits of valuable sulphur mineral had been found near Carupano; although work had scarcely begun, investigation showed that the deposits were almost inexhaustible and that their quality was most excellent. The best Sicilian deposits rarely contain more than 40 per cent. of pure sulphur and average about 25 per cent., but the Venezuelan minerals, it was said, averaged 62½ per cent. of pure sulphur. The proprietor of the mines secured a concession from the Government to build a tramway to one of the navigable rivers flowing into the Gulf of Paria; upon the completion of this it was expected that the sulphur industry would assume an important place in Venezuelan trade.

Commerce.—Hitherto Venezuelan commerce has not been of great amount, and the interior trade has been impeded by the mountains and forests. Exports, valued in bolivars, have been: 1889-90, 100,917,338; 1890-91, 118,952,508; 1892-93, 86,420,615; 1893-94, 107,655,694; 1895-96, 111,455,143. The principal export, coffee, has gone mainly to France, Germany, Italy and the United States. On account of the absence of a reciprocity treaty the export to the last-named country had decreased in 1893 to 3,718 bags, but with the readjustment of the tariff in the following year it began to increase, so that at present nearly the whole Venezuelan coffee crop comes to this country. In 1896 the exports from La Guaira amounted to £1,344,000 (coffee, £1,023,040); from Maracaibo, £2,114,128 (coffee, £2,084,124); from Puerto Cabello, £635,463; from Ciudad Bolivar, £426,802. The exports of most importance, besides coffee, are cocoa, the products of the herds, rubber, tonka beans, and dyewoods.

Shipping and Communications.—In 1896 there entered and cleared at La Guaira 296 vessels (649,600 tons); at Puerto Cabello, 296; at Maracaibo, 256; at Ciudad Bolivar, 137. There was a merchant marine in 1895 of eight steamers (total net tonnage, 1,259) and frontier sailing vessels (2,382 tonnage). Lake navigation is on the increase. In the same year there were 3,882 miles of telegraph lines, 43 telegraph offices, 200 post offices and 406 miles of railway in operation, with 1,000 miles under consideration. In January, 1898, the following statistics were published, giving the length of the Venezuelan railroads then in operation and the nationality of their owners:

	Kilometers.
Encontrado-La Fria (National)	100
La Ceiba-Valera (National)	90
Guanta-Naricual (National)	36
Maiquetia-Macuto (National)	8
Caracas-El Valle (National)	8
Caracas-Valencia (German)	179
Tucaca-Aroa (English)	89
El Hacha-Barquisimeto (English)	88
Valencia-Puerto Cabello (English)	55
Caracas-La Guaira (English)	37
Caracas-Batare (English)	10
Santa Barbara-El Vija (French)	60
Carenero-San José (Dutch)	33
Vela-Coro (United States)	17
Total length.....:	810

In the same month it was announced that a contract had been made between the Government and Dr. Jorge Valbuena for the construction of an aerial steel cable railway from the vicinity of Merida to some port in the Sucre district on Lake Maracaibo, or to Santa Barbara on the Escalante River, and of one from the Tovar valley in the Merida section, Los Angeles, to Escalante. The contract provided for the free transportation of the Government mails and for a reduction of 85 per cent. on Government freight and postal packages. Freight rates were to be fixed by the Government and were not to exceed 1.16 cents a kilogram; it was agreed that the work be begun within a year after the contract should be approved by the Congress, and the contractor was allowed to use any motive power he might select. The system is to be exempt from federal taxation, and after the expiration of the contract, which is to stand for fifty years, is to be given over to the Government. It became known in March, 1898, that the Government had contracted with a company for the construction of a railway, the motive power of which might be either steam or electricity, from Perico to Crucero, both on the right bank of the Orinoco River. The road is to be of public use; the Government grants the company a subsidy of \$3,860 a kilometer and exempts it from import tariffs on materials necessary for the construction and maintenance of the road. Freight and passenger rates will be established by the Government; Government mails must be carried free, and troops and Government employes at half rates. At the expiration of the contract, which is to stand for ninety-nine years, and which is transferable except to a foreign government, the road shall become the property of the Government. About the same time the Government made a contract, under essentially the same conditions as in the foregoing, with a company for the construction of a road from Los Teques to Cua, Miranda. Also a contract was made for the building and operating of lines of steel cables between Valencia (Carabobo) and Nirgua.

Religion and Education.—The State religion is Roman Catholic; other forms of faith are tolerated, but are not permitted formal and organized expression. In 1870 only 10 per cent. of the population could read and write; since that time education has been gratuitous and compulsory, but is still in a backward condition. In 1889 there were over 100,000 pupils receiving elementary instruction. The next year there were expended on federal schools 2,503,797 bolivars. There were in 1891, for primary instruction, 1,415 federal and 151 State schools. Besides these there are a school for arts and trades, 4 normal schools and 9 barrack schools. For higher education there are 22 federal colleges, 11 national schools for girls, 2 universities, schools for music, fine arts, polytechnics and nautical studies, and 26 private colleges. These institutions have 436 professors and 4,882 students. The expense for all kinds of federal schools in 1890 was 3,345,720 bolivars. The national museum and the national library (32,000 volumes) are in Caracas.

Money.—The Bank of Venezuela is the principal bank of issue and has a capital of 15,000,000 bolivars. In 1896 the hard currency amounted to about 12,000,000 bolivars in gold and 8,000,000 in silver. The bolivar is worth in United States gold \$0.193.

Current History.—The Anglo-Venezuelan boundary dispute of long standing is to be settled by a board of arbitration during the spring or summer of 1899. In response to a message of President Cleveland, in December, 1895, Congress authorized the appointment of a board to investigate the case and determine the true boundary. This was done on the ground that England was infringing upon the "Monroe Doctrine." The board discontinued its sittings on February 27, 1897, as on the 2d of that month the two governments signed in Washington a treaty whereby they agreed to submit the case to arbitration, the board to consist of two members chosen by each government and a fifth to be selected by these, or, in case of disagreement, to be named by King Oscar of Sweden. This treaty was ratified June 14, 1897. The jurists selected to represent Venezuela are Chief Justice Fuller and Associate Justice Brewer, of the United States Supreme Court, and to represent Great Britain are Baron Farrer Herschell and Justice Sir Richard Henn Collins. In December, 1897, it was announced that Professor Maertens, of St. Petersburg, the distinguished Russian jurist and authority on constitutional law, had been selected as the fifth member. He acts as president of the tribunal, which meets in Paris. The papers on the case are most voluminous; the British case and counter-case fill eleven volumes, one atlas and a number of detached maps, while the Venezuelan case comprises six volumes and three atlases. The brief for Venezuela is prepared by ex-President Harrison and ex-Secretary B. F. Tracy, of the United States, and Mr. Malet-Provost; that for England is presented by some of the ablest lawyers of that country, including Sir Richard Webster. The disputed territory, which is claimed by Great Britain as belonging to her Guiana colony, contains rich gold fields, discovered within the last few years.

In September, 1897, General Ignacio Andrade was elected president of Venezuela, his installation to take place during the following February. Señor Andrade, who

is a brother of the Venezuelan Minister to the United States, was elected without any disorder or uprising on the part of the people. The policy which he outlined for his administration in case of election, he stated in a letter in which he declared for peace with all nations, for internal development, and for the encouragement of immigration; the existing tariff laws he did not propose to change. Soon after the election a plot was discovered against the incoming administration, headed by Señor Hernandez and Señor Rojas Paul. According to the Constitution of Venezuela, the popular vote must be ratified by the Congress, and elections may take place only in time of peace; the conspirators proposed to delay the Senatorial election in December, so that the Congress, being unable to assemble, could not ratify Señor Andrade's election in time for his installation in February or March. About the first of November such vigorous measures were taken against the conspirators, about five hundred arrests being made, that the plot was successfully overcome. Señor Andrade was accordingly installed as president on the last of February, and General Joaquin Crespo, his predecessor, succeeded to the governorship of the State of Miranda; but in the meantime General Hernandez had been plotting a revolution, and an uprising immediately followed the installation of Señor Andrade. General Crespo, as commander of the Government forces, proceeded against the rebels, and for a time met with some success, but was killed on April 16. The insurrectionist party increased in strength, but on the night of June 12 General Hernandez was surprised and captured. His party, thus deprived of a leader, was soon overcome and the rebellion successfully repressed.

The new Administration began in June to put its policy into effect by making a contract with a society for Italian colonization, according to which agreement the society would bring into the country at least one thousand families during each of the succeeding fifteen years. Each individual was to receive from the Government eighteen francs a year during this period, and on reaching the country each person over ten years of age was to receive six hectares (14.8 acres) of land, while the tariffs on goods imported for immigrants were to be suspended. See *Bulletin Bureau Am. Rep.*, May, 1898.

VENTILATION. See SEWERAGE AND SEWER GAS.

VENUS. See ASTRONOMICAL PROGRESS.

VERBECK, REV. GUIDO FRIDOLIN, a pioneer missionary of the Reformed Church in America to Japan, died at Tokio, March 9, 1898. He was born at Zeist, province of Utrecht, Netherlands, January 23, 1830. Having studied at the Moravian Academy in his native town, he took up the work of civil engineering; came to the United States and continued his profession until 1856, when he entered the Theological Seminary at Auburn, New York, at which he was graduated in 1859. In February of this year he received an appointment as missionary to Japan, and was ordained by the presbytery of Cayuga. He was called to advise the Japanese Government in important educational matters, and gave shape and supervision to the government university. He accompanied the first deputation of Japanese to the outside world on its tour among the nations of Europe; for this and other services he received from the Government the decoration of the third class of the Rising Sun, which entitled him to appear at all public and court receptions. The Government also granted him privileges above those of any one else in his situation in the history of the country. By long absence he lost residence in the United States. Dr. Verbeck was recognized as a patient scholar, a counsellor and a statesman, and is said to have impressed his stamp upon the whole future of the new Japan.

VERGA, GIOVANNI. See ITALIAN LITERATURE (paragraph Fiction).

VERLAINE, PAUL. See FRENCH LITERATURE.

VERMONT, a New England State, has an area of 9,565 sq. m. Capital, Montpelier.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 1,984,106 bushels, value \$873,007; wheat, 87,075, \$78,368; oats, 4,107,420, \$1,437,597; barley, 532,170, \$250,120; rye, 61,846, \$35,871; buckwheat, 217,445, \$100,025; potatoes, 2,697,030, \$1,132,753; and hay, 1,260,505 tons, \$8,004,207—total value, \$12,039,700. Live stock comprised horses, 84,812; milch cows, 271,602; other cattle, 133,788; sheep, 165,940; and swine, 76,208—total head, 732,350.

Industries.—In quarrying the State held second place in 1897, Pennsylvania leading and Ohio following. The total output was valued at \$3,986,001, of which granite yielded \$1,074,300; slate, \$695,815; marble, \$2,050,229; and limestone, \$165,657. The production of granite was the largest on record in the State, due to increased activity at Barre, where two-thirds of the output was quarried. A still larger increase occurred in marble, in the production of which Vermont led all the States and quarried nearly two-thirds of the entire output of the country. Slate also showed

a marked increase and an encouraging export demand, and the entire product of limestone was burned into lime. Twenty plants produced brick and tile to the value of \$53,485. Soapstone was worked in Grafton and Chester.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise aggregated in value \$4,087,036; exports, \$8,042,429; a decrease in a year of \$2,512,892 in imports and \$882,530 in exports. During the calendar year 1898 the imports of gold were \$1,000; the exports of gold, \$340, and of silver, \$2,446.

Banks.—On October 31, 1898, there were 49 national banks in operation and 19 in liquidation. The active capital aggregated \$6,885,000; circulation, \$3,863,389; deposits, \$9,616,698; reserve, \$3,230,004. Mutual savings banks, June 30, 1898, numbered 41, and had depositors, 108,511; deposits, \$34,071,722; resources, \$36,928,962.

Railroads.—On January 1, 1898, the length of all main-line track and branches in the State was 985.74 miles, of which three miles were constructed in the previous year. The Central Vermont Railroad was placed in the hands of receivers in 1896, in a suit brought by the Grand Trunk Railway Company of Canada, and at the time of writing litigation was still in progress, with no indication of speedy reorganization or liability adjustment.

Education.—At the end of the school year 1896-97, the school population was 90,166; public school enrollment, 65,349; attendance, 50,465. There were 1,912 public school-houses; 2,381 teachers; public school property valued at \$1,500,000; and expenditures, \$912,996, including \$631,991 for teachers' salaries. Institutions for higher education comprised 50 public high schools, 26 private secondary schools, 3 public normal schools, 2 colleges, with 11 professors and instructors, 378 students and \$91,302 income, and a technical and a medical school. The State Agricultural College at Burlington, endowed by Congress, received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. In the various higher institutions the libraries had an aggregate of 125,754 volumes, including over 16,000 in the high-schools. The periodicals in 1898 numbered 84; dailies, 5; weeklies, 65.

Finances.—The assessed valuations for 1898 were, real estate, \$116,141.979; personal property, \$41,123,154—total, \$157,265,133; tax rate for State schools and State highways, \$1.50 per \$1,000. The total debt, July 1, 1898, excluding the school and highway taxes to be distributed among the towns, was \$303,222; total resources, \$537,619. All of the bonded debt (\$135,500) is held by the State in trust for the Agricultural College fund.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 335,000. Local censuses and estimates gave Burlington 16,636; Barre, 8,000; Bennington, 6,391; Montpelier, 6,000; Bellows Falls, 4,579; Swanton, 3,230.

Legislation.—The Legislature, May 6, voted \$7 a month for each soldier, sailor and marine in service from Vermont. The Governor was directed to furnish a three-battalion regiment of infantry over one thousand strong, and the treasurer was ordered to borrow \$200,000 to cover war expenses. Resolutions commending Commodore Dewey and advocating his immediate promotion were passed by both houses.

The Governor induced the legislature to pass a bill in November, the object of which is to induce wealthy persons, who have been heavily assessed in other States, to enter Vermont under a contract that their taxes shall not be above a specified amount for a specified period. This novel measure to attract capital provides for a Board of Tax Examiners, empowered to make an agreement with non-residents who will enter the State and dwell there as to taxes for a period not exceeding thirty years.

Political Platforms.—The Republican Convention, in June, reaffirmed its loyalty to the St. Louis platform of 1896, especially the doctrines of protection and sound money. It declared itself opposed to the re-surrender to the Spanish misrule of any territory which the valor of our army and navy had rescued, or might thereafter rescue, from the hands of the enemy; it further expressed an abiding confidence that a Republican President and Congress would so shape the future of such territory as best to promote the welfare of its inhabitants and the true glory of our country. The platform also welcomed the signs of sympathy and unity between North and South and the good feeling with Great Britain. The belief was stated that the United States should build and control the Nicaragua Canal. Colonel E. C. Smith, of St. Albans, was unanimously nominated for Governor.

The Democratic State Convention indorsed the platform of the Chicago National Convention of 1896 and a tariff for revenue only. It opposed the admission of the Hawaiian Islands to statehood, and expressed "undiminished admiration of and confidence in William J. Bryan." It furthermore declared: "The Republican administration, in its declaration of war, solemnly declared to the world that the purpose of this country in entering upon the war with Spain was solely one of humanity, and its declaration expressly disavowed any intention of setting up or asserting the sovereignty of the United States in any conquered territory. We

accept that declaration as made in good faith and binding upon the administration and the country, and we believe that the present war should be vigorously prosecuted and promptly ended. We oppose the proposed imperialistic policy of the Republican party in the annexation or colonization of any territory won from Spain by our arms."

Elections.—The biennial State and Congressional elections were held September 6, 1898. High license was a burning question, but the Prohibitionists did not poll as many votes as in the last election. The Republicans elected their candidate, Edward C. Smith, for Governor by about 24,000 plurality, against 39,000 in 1896. They also re-elected their two Congressmen, Grout and Powers, but the Democrats made great gains in the State legislature, securing forty-two seats to only seventeen in 1896. On joint ballot the Republicans have a majority of 187.

National Representatives and State Officers.—Vermont's representatives are Henry H. Powers (Rep.), from Morrisville, and William W. Grout (Rep.), from Barton. Senators: Justin S. Morrill (Rep.), from Strafford; Redfield Proctor (Rep.), from Proctor. The State officers are: Edward C. Smith, Governor; Henry C. Bates, Lieutenant-Governor; Frederick A. Howland, Secretary; John L. Bacon, Treasurer; Orion M. Barber, Auditor; T. S. Peck, Adjutant-General, and Mason S. Stone, Superintendent of Education. All are Republicans. Chief Justice, Jonathan Ross; Assistant Justices, Loveland Munson, John W. Rowell, R. S. Taft, H. R. Start, L. H. Thompson and James M. Tyler; Clerk, M. E. Smilie. All are Republicans. The State Legislature consists of 231 Republicans, 42 Democrats, 1 Prohibitionist and 1 Non-Partisan.

VICTORIA, a British colony in Australia occupying the southeastern corner of the continent and having an area of 87,884 sq. m., with a population estimated on June 30, 1897, at 1,177,304 (according to a later estimate, 1,179,029). About 9,000 were Chinese and between 500 and 600 Aborigines. The capital is Melbourne, the largest city in Australia, with a population in 1896 of 451,110 (according to a later estimate, 458,610). It is estimated that out of the total acreage of Victoria, viz., 56,245,760, about 8,300,000 acres are suitable for agriculture. The acreage cultivated has not increased much in recent years. In 1896 there was a marked falling off in the production of wheat, owing chiefly to the lack of rain. The chief occupations are agriculture, mining and manufactures. The production of wool is especially important, and it has steadily increased in recent years. The two staple articles of export from the colony are wool and gold. The exportation of the former in the year 1896 was valued at £4,959,404, of the latter, £3,299,012. In 1896 the total imports were £14,554,837; the exports, £14,198,518. In 1896 the shipping entries amounted to 2,276,478 tons, the clearances to 2,289,752 tons, a large share being British. The output of gold, though it has decreased considerably since the year 1856, when it was valued at £12,000,000, has increased since 1892. In 1896 it was valued approximately at £3,220,348. There is a tariff on imported goods, the customs duties collected in 1896 amounting to about 13 per cent. of the total imports. The public revenue is derived mainly from customs duties and other taxes and from railways. The estimated revenue for the year 1898-99 was £6,907,439 and the estimated expenditure, £6,873,529. The outstanding public debt on June 30, 1897, amounted to £46,929,321, of which the largest part was incurred in the construction of the railways, all of which now belong to the government. The executive authority is vested in a governor appointed by the crown, aided by an executive ministry of ten members and the legislative parliament, comprising a legislative council of 48 members and a legislative assembly of 95 members. The Governor and Commander-in-Chief in 1898 was Lord Brassey, and the Premier and Treasurer, Sir George Turner.

History.—The third session of the Australian Federal Convention was held at Melbourne from January 20 to March 17, 1898. The popular vote on the question of federation gave 100,520 votes for the bill and 22,099 against it. It was reported upon the submission of the budget estimate by Sir George Turner that the industrial and agricultural outlook was favorable and that the trade of the country was flourishing.

VILLA, ROMAN. See ARCHÆOLOGY (paragraph France).

VILLIERS, FREDERICK, war artist and correspondent, was born in London April 23, 1852. He was educated in France. He served as war artist and correspondent for London papers in Serbia and Turkey in 1876-77; in the Soudan and Abyssinia in 1884, and was with the Japanese army at Ping Yang and in the march to and taking of Port Arthur in 1894; made a trip around the world in 1895, and joined the Greek army in 1897. In August, 1898, he joined the Sirdar's army on its march to Omdurman, and was present at the great battle. He was the first to use the cinematograph camera during war, and he introduced the bicycle in the Soudan, taking it from London to Khartoum and back.

VILLIERS, RIGHT HONORABLE CHARLES PELHAM, Liberal-Unionist M. P. for South Wolverhampton, died in London, England, January 16, 1898. Born January 3, 1802, he was graduated from Cambridge in 1824 and in 1827 received his M.A. and was admitted to the bar. His parliamentary career, which extended over a period of sixty-three years, began in 1835, although as early as 1826 he had been an unsuccessful reform candidate. The life of Mr. Villiers was a link between modern English politics and the public questions of the earlier part of the century. In 1838 he introduced a bill for the repeal of the Corn Laws and repeated this each year until success was attained. He was associated in this movement with Daniel O'Connell, John Bright, Cobden, Sir William Molesworth and other prominent English Liberals; and when, in 1846, the Corn Laws were finally passed, success was due, it is said, as much to Mr. Villiers' parliamentary tact as it was to Cobden's accurate knowledge of economic conditions and to Bright's eloquence. In 1852 he became a member of Lord Aberdeen's ministry, acting as Judge Advocate-General, and in 1859 he entered the Palmerston-Russell cabinet. In 1866 he resigned office, but continued to represent Wolverhampton to the time of his death. Mr. Villiers was an important advocate of the measures which Parliament has framed relating to electoral reform, to municipal reform, to the poor laws, to education, to the extension of the franchise and to the Irish church disestablishment.

VIRDEN, ILLINOIS. See STRIKES and LOCKOUTS.

VIRGINIA, a Southern Atlantic State, has an area of 42,450 sq. m. Capital, Richmond.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 38,756,564 bushels, value \$13,564,797; wheat, 10,626,112, \$7,013,234; oats, 6,880,641, \$1,995,386; rye, 442,210, \$203,417; buckwheat, 82,331, \$37,049; potatoes, 2,434,332, \$1,338,883; hay, 720,077 tons, \$6,120,654; and cotton (season of 1897-98), 12,878 bales, \$374,196—total value, \$30,647,616. Live-stock comprised, horses, 233,940; mules, 35,998; milch cows, 244,937; other cattle, 338,542; sheep, 369,527; and swine, 917,550—total head, 2,140,494.

Industries.—The most valuable mineral production in the calendar year 1897 was coal, of which 21 mines had an output of 1,528,302 short tons, valued at \$1,021,918, an increased production of 22 per cent. in a year and the largest total in the history of the State. Iron ranked second, with 711,128 long tons, value \$974,031, of which 697,558 tons were brown hematite, in which the State led all others. Clay products, principally brick and tile, had a total value of \$812,046; and quarrying yielded \$426,438, with limestone, \$192,972; slate, \$145,370, and granite, \$88,096. The coking industry had six plants with 1,453 ovens, which used 574,542 short tons of coal and produced 354,067 short tons of coke, value \$495,864. In manganese the State led all others, with 3,650 long tons, value \$33,630, and in gypsum it had a product of 6,374 short tons, value \$16,889. Out of 41 mineral springs 34 reported sales of 617,106 gallons of waters, worth \$216,533. Cotton manufacturing was carried on in 15 mills, which operated 150,993 spindles, and bought 42,880 bales of cotton for consumption. The various taxable manufactures of the State yielded the Federal Government \$3,403,768 in internal revenue in the year ending June 30, 1898. Tobacco led with a production of 104,133,443 cigars, 996,254,640 cigarettes, 30,437,002 pounds of plug, 4,435,565 pounds of smoking, and 908,827 pounds of snuff. There were 1,151 distilleries of all kinds in operation, and a production of 235,856 gallons of corn whiskey and 138,144 barrels of fermented liquors.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise at the ports of Alexandria, Newport News, Norfolk and Portsmouth and Richmond, aggregated in value \$1,318,945; exports, \$44,269,999, a decrease in a year of \$73,850 in imports and an increase of \$3,578,892 in exports, and a net increase in total foreign trade of \$3,505,042.

Banks.—On October 31, 1898, there were 36 national banks in operation and 19 in liquidation. The active capital aggregated \$4,596,300; circulation, \$2,421,835; deposits, \$17,845,761; reserve, \$5,558,533. The State banks June 30, 1898, numbered 92, and had capital, \$5,486,643; deposits, \$17,374,286; resources, \$26,445,105; surplus, \$1,763,977. The exchanges at the United States clearing houses at Norfolk and Richmond, in the year ending September 30, 1898, aggregated \$173,581,484, a net increase in a year of \$11,303,340.

Transportation.—On January 1, 1898, the total direct length of all steam railroads in the State was reported at 3,628.70 miles, of which 27.50 miles were constructed during the previous year. There were 37 different operating lines, and the mileage of main and secondary tracks and sidings was variously reported at from 4,499 to 7,000 miles. The street railways had a total trackage of about 210 miles. At the close of 1898 the work of improving the old Dismal Swamp canal had progressed so far that it was expected this waterway would be opened to navigation by April 1, 1899. The canal extends from Deep Creek, Va., to South Mills, N. C., a distance of 22 miles, and connects Chesapeake Bay with Albemarle Sound. It was long ago a famous

waterway, but since the Civil War it had fallen into almost complete disuse. The improved canal will have a large beneficial influence on the coastwise traffic between the North and South.

Education.—At the close of the school year 1896-97, the school population was 665,865; enrollment, 367,817; daily attendance, 213,421. The percentages of enrollment by races was, white, 59.37; colored, 55.34. There were 8,529 school-houses, 8,575 teachers, public school property valued at \$3,090,777, and expenditures, \$1,853,539, of which \$1,459,959 was for teachers' salaries. The revenue of the school system from all sources was \$1,863,704. For higher education there were 64 public high schools, 85 private secondary schools, 4 public and 6 private normal schools, 10 colleges and universities, co-educational and for men only, with 122 professors and instructors, 1,362 students, and \$267,980 income; 15 colleges for women, with 204 instructors, 1,172 students and \$165,815 income; 2 technical schools and 4 theological, 3 law and 2 medical schools. The various higher institutions had a total of 225,142 volumes in their libraries. The classic Rotunda, with its stately annex, of the State University at Charlottesville, which was destroyed by fire in 1895, was restored, and three new buildings were completed early in 1898. The periodicals in 1898 numbered 272; dailies, 30; weeklies, 184; monthlies, 43.

Finances.—The assessed valuations for 1897 were, real estate, \$306,036,001; personal property, \$99,198,824—total, \$405,224,825; tax rate, \$4 per \$1,000. Total debt, October 1, 1897, \$24,249,271, representing the outstanding bonds issued under the act of 1892, \$17,919,717, and those issued under the act of 1882 (Riddleberger bonds), \$6,329,554. There were also outstanding \$15,239,370 in funded certificates, representing a third of the debt of Virginia and West Virginia together, which, on the readjustment of the debt of Virginia in 1871, were set aside as the share of West Virginia. That State subsequently repudiated this obligation, and the matter has never been adjusted.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 1,772,000. Local estimates gave Richmond 100,000; Norfolk, 42,000; Danville, 18,000; Staunton, 11,875; Charlottesville, 9,220; Harrisonburg, 3,630, and Buena Vista and Wytheville, each, 3,500.

Legislation.—The marked development of "government by injunction" since the labor troubles of 1894 has led to several attempts to restrict the power of courts to punish for contempt. In 1898 a law was adopted in Virginia dividing contempts into two classes, direct and indirect, and providing a trial by jury in case of indirect contempts. It has been declared unconstitutional by one of the Circuit Courts, and is now before the Supreme Court.

A law was passed compelling all employers of labor in stores, factories, offices or workshops to provide their female employes with suitable seats, and forbidding any rules or regulations to prevent their use when the women are not actively engaged in their work or business. Any violation of this statute is a misdemeanor.

The law regarding the mutual testimony of husband and wife in the courts of law was so amended that they may testify for, but cannot be forced to testify against, each other. If, however, in any case one testifies as witness for the other, that one is deemed competent to testify against the other also; but failure to testify shall create no presumption against the accused, nor be the subject of any command of the court or trial by the prosecuting attorney. "Neither husband nor wife shall, without the consent of the other, be examined in any case as to any communication made by one to the other while married, nor shall either of them be permitted, without such consent, to reveal in testimony after the marriage relation ceases any communication made while the marriage subsisted; provided, that this exclusion shall not apply to a criminal proceeding for a criminal offense committed by one against the other, but as to such proceeding the existing rules of evidence shall remain unchanged."

Another law prohibited the manufacture of imitation butter, and ordered that every hotel, restaurant, or boarding-house that served it or used it in cooking should post and exhibit in their stores, restaurants, and dining-rooms a placard with the inscription, "Imitation butter used here" in Roman letters not less than one inch square.

Elections.—The November election in Virginia was for Congressmen only. Apathy existed in both parties and the vote was one of the smallest in twenty years. The proceedings were generally quiet. In the "black belt" the Republicans were so divided by factional fights that the Democrats had an overwhelming majority. The greatest interest was shown in the Fifth District, where Edmund Parr (Rep.) opposed Claude A. Swanson (Dem.). In order to circumvent the notorious Parker Election Law in Virginia, and to secure evidence in case the election should be contested, the Republicans at Martinsville had a ballot-box and checks. As each cast his ballot he stepped over to the Republican manager and told how he had voted. A check was made out and put into the box. However, Swanson carried the district by 3,601 plurality.

National Representatives and State Officers.—Virginia's representatives are: W. A. Jones, from Warsaw; William A. Young, from Norfolk; John Lamb, from Richmond; Sydney P. Epes, from Blackstone; Claude A. Swanson, from Chatham; Peter J. Otey, from Lynchburg; James Hay, from Madison; J. F. Rixey, from Brandy; William F. Rhea, from Bristol, and J. M. Quarles, from Staunton. All are Democrats. Senators: John W. Daniel (Dem.), from Lynchburg, and Thomas S. Martin (Dem.), from Scottsville. Officials: J. Hoge Tyler, Governor; Edward Echols, Lieutenant-Governor; James T. Lawless, Secretary; A. W. Harmon, Treasurer; Morton Marye and Josiah Ryland, Auditors; A. J. Montague, Attorney-General, and J. W. Sutthall, Superintendent of Education. All are Democrats. President Supreme Court of Appeals. James Keith; Justices, John W. Riely, John A. Buchanan, George M. Harrison and Richard H. Cardwell; Clerk, G. K. Taylor. All are Democrats. The State legislature consists of 130 Democrats, 8 Republicans, 1 Populist and 1 Independent.

VITALISM. See BIOLOGY (paragraph Vitalism).

VIVO, DIEGO DE, a well-known impresario, died at his home in New York City, August 11, 1898. He was born in Sarno, Salerno, Italy, in 1822; studied for the priesthood, but entered the army; in 1854 his republican principles led to his expulsion from the country. He came to the United States and began his career as operatic manager, the most active period being from 1868 to 1883. Subsequent to the latter date he became well known in operatic circles in Australia. In this country he introduced many operatic stars, including Parepa Rosa, Carlotta Patti, Salvini, Wachtel, Ristori, Gottschalk and Anton Rubinstein.

VOLUNTEER MEDICAL CORPS, AMERICAN, organized in 1888 for the purpose of tendering their services to any city stricken with yellow fever. President, Joseph Y. Porter, M.D., Key West, Florida; secretary, Philip H. Strausz, M.D., 1327 Washington street, Toledo, Ohio.

VOLUNTEERS OF AMERICA were formed in 1896 by a large secession from the Salvation Army (q. v.), headed by Commander and Mrs. Ballington Booth. In 1898 they reported 205 posts, 590 commissioned officers, 2,000 workers, 15,000 conversions, 23,400 open-air meetings, 70,000 indoor meetings. The Volunteers' Prison League, under Mrs. Ballington Booth, is now established in 9 of the largest convict prisons. It reports an enrollment in the League of 3,000 men, 3 prison homes (Hope Halls); Poor Men's Homes have been opened in 12 cities; Sunday schools were established, and much charitable work was accomplished. Headquarters, Union Square and East 16th street, New York. Ballington Booth, commander-in-chief.

VORTEX. See PHYSICS (paragraph Vortex Motion).

WADE, MAJOR-GENERAL JAMES F., was chairman of the commission appointed by President McKinley, August 16, 1898, and consisting of General Wade, Rear-Admiral Wm. T. Sampson and Major-General Matthew C. Butler, to arrange for the evacuation of Cuba by the Spaniards. He was graduated at West Point; in 1861 became a first lieutenant in the Sixth United States Cavalry; entered the volunteer service and was raised to the rank of brigadier-general by brevet. In 1866 he was made captain in the regular army, lieutenant-colonel, 1879, and colonel of the Fifth Cavalry, 1887. In 1897 he was promoted to the rank of brigadier-general, and at the outbreak of the Spanish-American War was appointed major-general of volunteers.

WAGES. In September, 1898, the Labor Department at Washington published some very interesting tables showing the movement of wages in the United States and Europe from 1870 to 1898. To prepare these tables the United States Commissioner of Labor secured the co-operation of the head of the Labor Department in England and the chiefs of the Bureaus of Labor in France and Belgium. The wages quoted were in each instance nominal wages, and no attempt was made to show the movement of prices during the same period. An investigation of prices of a very thorough character had been, it will be remembered, undertaken a few years before by the Senate Finance Committee, and its results were published in a report on Wholesale Wages and Transportations, which appeared in 1893. It is supposed that since 1892 the tendency of prices has been slightly downward. There is no doubt that since 1870 prices have generally decreased. This, of course, would enhance the purchasing power of wages, and if wages can be shown to have advanced during that same period the condition of the wage-earner must have greatly improved.

In order to secure satisfactory results in this investigation, it was necessary to select occupations which were definite in nature, and whose equivalents could readily be found in foreign countries. Twenty-five such occupations were selected and wage data in regard to each secured in twelve large cities of the United States and in London and Manchester in England, Glasgow in Scotland, Paris in France, and Liège in Belgium. The period comprises the years from 1870 to 1898 in the United States.

but owing to the difficulties of securing foreign statistics the period closed with 1896 for the foreign statistics. A great mass of data was secured from firms which had done business continuously since the year 1870. The number of employes working on full time, together with their rates of pay each year, was ascertained, and wherever it was possible, the quotations were secured from at least two establishments in each city. From these data tables were prepared summarizing the results. The first of these tables deals with the twelve cities of the United States from 1870 to 1898. Care has been taken to make due allowance for the depreciation of the currency from 1870 to 1878. The following are a few of the specimen figures from this table. The wages of blacksmiths in Baltimore rose from \$1.96½ in 1870 to \$2.28¼ in 1884, and then, after fluctuating from year to year, fell to \$2.00 in 1898. In Boston they started at \$3.00 and reached their highest point three years later (1873), when they were \$3.18, and in 1898 they had fallen to \$2.76. In Chicago between 1870 and 1898 there was a rise of 30 cents. In Cincinnati there was a rise of 18¼ cents during the period, but in the early eighties the figures reached their highest point. In New Orleans they declined 27½ cents. In New York they rose 30 cents; in San Francisco they declined from \$3.80¾ to \$3.12, while in all the other cities investigated there was a rise. The averages for the twelve cities during this period was \$2.43, and the highest point was reached in 1872, when wages were \$2.70. From 1881 to 1889 inclusive, the rate was always about \$2.60, while in 1898 it had fallen to \$2.43½. These are the figures for the blacksmith's trade. Space is lacking for a detailed account of the twenty-four other occupations, but the following figures show the average in each of these trades in the twelve cities of the United States in 1870 and 1898 respectively:

Average Daily Wages in Twelve Cities of the United States in
1870 and 1898 respectively.

	1870.	1898.
Blacksmiths' helpers	\$1.40¼	\$1.52¼
Boiler-makers	2.35¾	2.56½
Boiler-makers' helpers	1.41	1.53¼
Bricklayers	3.50¾	3.51¾
Cabinet-makers	2.14	2.29¾
Carpenters	2.36¾	2.52¾
Compositors	2.52¼	2.81½
Conductors, railroad	3.43	4.03¼
Engineers, railroad	3.22¾	4.42¾
Firemen, railroad	1.75	2.26
Hod carriers	1.75¼	2.00½
Iron-moulders	2.60½	2.60½
Iron-moulders' helpers	1.53	1.58¼
Joiners	2.25¾	2.47
Laborers, street	1.46¼	1.65½
Laborers, other	1.39¾	1.45¼
Machinists	2.30¼	2.41
Machinists' helpers	1.34	1.35½
Masons, stone	2.80¼	3.20¼
Painters, house	2.22¼	2.60
Pattern-makers, iron works	2.70	2.90
Plumbers	2.74½	3.15½
Stone cutters	3.07	3.23
Teamsters	1.58¾	1.88½

The second table gives the average daily wages in certain cities of Great Britain, France and Belgium from 1870 to 1896. The following are some specimen figures taken from this table: In the blacksmith's trade the average rate for the three cities of London, Manchester and Glasgow was, in 1870, \$1.19¾; in 1896, \$1.52; for Paris, France, it was \$1.19½ in 1870 and \$1.71½ in 1896; in Liège, Belgium, 68½ cents in 1870 and 89¼ cents in 1896. The wages of cabinet-makers were, for the three cities of Great Britain, \$1.30 in 1870 and \$1.53 in 1896; for Paris, \$1.28¼ in 1870 and \$1.65½ in 1896; in Liège, Belgium, 67½ cents in 1870 and 70¾ cents in 1896. The average rate of compositors for the three cities of Great Britain was \$1.26½ in 1870 and \$1.44¾ in 1896; in Paris, \$1.15¾ in 1870 and \$1.25½ in 1896. In Liège, 64 cents in 1870 and 79¾ cents in 1896. The average wage of iron moulders for the three cities of Great Britain was \$1.46 in 1870 and \$1.60¼ in 1896; in Paris, \$1.23 in 1870 and \$1.39¼ in 1896; in Liège, 72½ cents in 1870 and 79¾ cents in 1896. The average wage of machinists in the three cities of Great Britain was \$1.34 in 1870 and \$1.50¼ in 1896; in Paris, \$1.33¼ in 1870 and \$1.38 in 1896; in Liège, 65¾ cents in 1870 and 68¼ cents in 1896.

The following table is a summary based on the larger tables and shows in compact

form the movement of wages from year to year in the four countries, namely, Great Britain, France, Belgium and the United States. As the data on which the United States statistics rest are much fuller than those for the foreign cities, this summary cannot be used safely for a comparison of the rates in the four countries, but only to trace the course of wages from year to year in each country. And it must be remembered that these average rates are based only on the returns from cities and do not show the average wage for the country as a whole, although they do represent in a general way the condition of wages in the whole country.

Average Daily Wages in Gold in Certain Cities of the United States,
Great Britain, France and Belgium.

Year.	Great Britain.	Paris, France.	Liège, Belgium.	United States.
1870	\$1.30	\$1.06	\$ 59½	\$2.20½
1871	1.30¼	1.06½	60¼	2.39¼
1872	1.33	1.07½	61	2.45
1873	1.35	1.08¼	64	2.35½
1874	1.36¾	1.08½	65¼	2.30¼
1875	1.38	1.11¼	63½	2.24¼
1876	1.40½	1.12	63	2.18
1877	1.41½	1.15¼	62½	2.24½
1878	1.40¼	1.16¾	60½	2.30¾
1879	1.37¼	1.16¾	61¼	2.32
1880	1.37¼	1.21¼	62¼	2.34
1881	1.37¾	1.22¼	63¾	2.40¼
1882	1.39¼	1.24½	65½	2.44¾
1883	1.40¼	1.24¾	65	2.47
1884	1.40¼	1.24¾	64¾	2.49
1885	1.39¾	1.24¾	63¼	2.47¼
1886	1.39	1.25¾	63	2.47¼
1887	1.39¼	1.25¾	62¼	2.49¼
1888	1.40	1.25	63¼	2.50¾
1889	1.40¾	1.26¾	62¾	2.51½
1890	1.41¾	1.31¼	63¼	2.52¾
1891	1.43¾	1.31½	65	2.54½
1892	1.43¾	1.31½	64	2.56
1893	1.44½	1.32	64¼	2.54½
1894	1.44¾	1.32½	65½	2.49¼
1895	1.45	1.32½	65¼	2.47¼
1896	1.49	1.33	66¼	2.45¾
1897 .....	.....	.....	.....	2.44½
1898 .....	.....	.....	.....	2.43½

From this table it appears that in Great Britain there was a gradual increase of wages from 1870 to 1877, then a slight falling off in 1878 and a still greater decline in 1879 and 1880. From 1886 to 1896 there was a steady increase. In France the increase was almost uniform from 1870 to 1896, although in 1888 there was a slight decline. In Belgium the rate rose from 59½ cents in 1870 to 65¼ cents in 1874, and then after various fluctuations reached 66¼ cents, its highest point, in 1896. In the United States there was a considerable rise of wages in 1871 and in 1872, then a gradual decline and, after some fluctuations, a steady rise from 1887 to 1892, since which date there has been a slight but steady decline.

The only safe method of comparing the rate paid in the cities of Great Britain and in Paris and Liège with that paid in the cities of the United States is to take each trade separately. If this be done, the uniformly higher rate paid in the United States is strikingly apparent.

The above statistics of wages in the United States would be more valuable if in connection with them was given an account of the movement of prices during the same period. Exact figures on this latter point, however, are lacking and we are obliged to content ourselves with general deductions from that Senate report on Wholesale Prices, Wages and Transportation, which has already been mentioned. This report carries its statistics down only to the year 1891, but the change in prices since that year has not been so great as to make its conclusions inapplicable to recent years. In general, the items of expenditure which have increased in the United States are meats, dairy products and house rents, while other commodities have decreased in as great proportion. Manufactured goods have, of course, cheapened and there has been a great increase in the purchasing power of money as applied to all such things as may be classified under the heads of transportation, intercommunication and education. There are diverse views in regard to the purchasing power of

money in 1898 as compared with its purchasing power fifty years ago, but economists are generally agreed that the net result to the wage-earner is a decided gain, although that gain does not, of course, correspond to the increase of nominal wages. Yet many believe the purchasing power of money is as great now as it was then, the increased price of some commodities being offset by the decrease in the price of others.

On this subject the report of the State Bureau of Labor Statistics of Massachusetts, published in March, 1898, is of interest. It gives the results of an investigation undertaken for the purpose of comparing the data of wages and prices for the years 1860, 1872, 1878, 1881 and 1897. For this purpose the average weekly wages paid in twenty-two leading industries were ascertained and quotations of the retail prices in different towns and cities, together with information as to rents and prices of board, were secured. A comparison of the wage rates for 1872 and 1897 showed that out of eleven industries, seven had declined and four increased. The following table gives the results:

Comparison of Wage Rates in 1872 and 1897.

	Increase. Per cent.	Decrease. Per cent.
Building trades	1.09	
Carpetings	68.92	
Metals and metallic goods	56.93	
Paper	26.32	
Agriculture		9.88
Blacksmiths		2.68
Boots and shoes		6.37
Cabinet-making		8.37
Carriages		21.95
Clothing, ready-made		7.21
Machines and machinery		21.97

The comparison of the wage rates in 1881 with those of 1897 shows an increase of fifteen of the classified industries and a decrease in eight. The figures are as follows:

Comparison of Wage Rates for 1881 and 1897.

	Increase. Per cent.	Decrease. Per cent.
Agriculture (laborers paid by the month, with board)	2.78	
Boots and shoes	7.59	
Building trades	43.91	
Cabinet making	13.12	
Carpetings	39.06	
Carriages	0.60	
Cotton goods	1.58	
Glass	12.64	
Metals and metallic goods (fine work)	15.09	
Musical instruments	14.23	
Printing	31.04	
Rubber and elastic goods	31.75	
Stone	4.68	
Straw goods	15.31	
Woolen goods	4.93	
Agriculture (laborers paid by the day without board)		8.76
Blacksmiths		2.32
Clothing, ready-made		17.34
Hosiery		12.23
Leather		4.62
Machines and machinery		34.47
Metals and metallic goods (not fine work)		29.14
Paper		1.69

This table shows nothing in regard to the increase or decrease of real wages until it is supplemented by statistics of prices from which the purchasing power of money may be made to appear. In all cases, of course, the prices of commodities quoted were those of the retail market. The articles and items of expense are classified under the heads of groceries, provisions, fuel, drygoods, boots, rents and board. The price quotations of groceries in 1872, when compared with that of 1897, showed a decline of 30 per cent. Provisions declined 18.52 per cent. Fuel, dry goods, boots, rents and board were all lower in 1897 than in 1872. In general, the purchasing power of a dollar was considerably greater in 1897 than in 1872, and some of the percentages of

increase are very large. For example, increase in the quantity of granulated sugar purchasable for a dollar in 1897, as compared in 1872, was 114.41 per cent.

The comparison of prices in 1881 with those in 1897 also shows a decline. In groceries, however, the decline was only 6.67 per cent. In provisions it was 18.52 per cent., the same as the decline since 1872. Fuel, drygoods and boots were also lower in price in 1897 than in 1881. In rents there was a slight decrease in the case of six-room tenements, and a slight increase in the case of four-room tenements. The rates for board slightly decreased between 1881 and 1897 in the case of men's rooms, but for women's rooms the rents were slightly higher in 1897.

The material is lacking for a comparison of prices during this period in European countries, but in Belgium a few years ago there was a detailed inquiry on the subject of workingmen's wages and the cost of living. It investigated 188 workingmen's families and obtained information not only as to average daily wages and the amount of expenditure, but included the composition of the workingmen's families, the age of each member and the number of children, etc., the general resources of each family and the classification of the expenditures as material, especially such as related to, first, habitation, clothing, fuel, food, etc.; secondly, religious, moral and intellectual objects; and, thirdly, luxuries. As to the daily wages, a comparison between the years 1846 and 1891 showed that wages had more than doubled. Between the years 1880 and 1891 the reduction of the average daily hours of labor amounted to twenty-nine minutes. The information procured as to the mode of expenditure showed that the greatest part of the workingman's income was expended for the necessities of life. From this it appears that a large part of the increase in the workingman's wages during the previous forty years went to provide him and his family with more substantial and abundant nourishment. The actual number of pounds of food consumed by an adult workingman in 1891 was considerably greater than in 1853. Not only did the amount increase, but the quality of the food improved. The bread, which is the most important element in the workingman's food, was made wholly of wheat, replacing the rye bread, which formerly constituted nearly 50 per cent. of the bread consumed by the workingman. According to Engel's Law, we would expect the proportionate share of the income applied by the wage-earner to the purchase of necessities to diminish as the wages increased, and an ever-increasing share to be devoted to the purchase of luxuries before the gratification of a higher class of wants. This investigation in Belgium, however, showed that the expenditures for religious, moral and intellectual purposes represented only 2 per cent. of the total budget, this percentage having remained almost exactly the same as in 1853. In the purchase of luxuries there was a slight increase, as compared with 1853. The great part of the increase in the workingman's income has, therefore, been devoted to the purchase of more abundant and more nutritious food. This merely goes to show that the operation of Engel's Law does not appear until the primary wants are satisfied. The workingman of 1853 was insufficiently supplied with food, and naturally the increase in his wages was first used by him to improve his condition in this respect.

A report on changes in wages and hours of labor in the United Kingdom was published by the Labor Department of the British Board of Trade in 1898, and an abstract was given of it in the Bulletin of the United States Department of Labor for September, 1898. From this it appears that wages continued to increase in 1897 as in the preceding year. And it was declared that the year 1897 had been more favorable to the workingman in regard to wages and hours of labor than any of the four preceding years. A table presenting the increases and decreases in weekly wages and the number of employes affected thereby shows that the number of wage-earners who were benefited by the increase of wages was much larger than the number affected by the decrease. As to the hours of labor, of 254 changes all but seven resulted in the reduction of the laboring man's working time.

The Living Wage Movement.—The so-called minimum wage is a feature of the programmes of many of the labor parties. This minimum cannot, of course, be uniform, since the conditions under which wages are earned are diverse. Account must be taken of the nature of the employment, for evidently the minimum wage in employments which involve danger to life or health should not be the same as that in occupations which can be pursued with comparative security. Before the organization of labor in trade unions, it was impossible to fix upon a standard rate of wages. The rule of buying in the cheapest and selling in the dearest market applied to labor as to commodities. In other words, wages were left to depend upon the ordinary law of demand and supply. After labor was organized, the trade unions sought to control the rate of wages by limiting the supply of labor, but the frequent disputes between employers and the unions gradually led to the abandonment of this principle in favor of the rule that wages should follow prices. In recent years this latter principle has been generally recognized by the unions of skilled laborers, while the unorganized, unskilled laborers still remain for the most part subject to the law

of supply and demand. Along with this change has come a change in the attitude of the state toward labor questions, as illustrated by the great mass of legislation affecting hours of labor, employment of women and children, and sanitary conditions. This legislation proceeds on the principle that the standard of life of the wage earner is a matter of public concern. The general result in more advanced countries is that the laborer has reached a condition in which he is far more independent than formerly of the mere law of demand and supply. At the same time there has developed among the workingmen themselves the idea of the living wage, namely, that wages should constitute the first charge on industry, and the general public seems to be inclining to the view that high wages mean increased efficiency. The results of several important labor disputes in recent years seem to show that the former policy of living wages to be adjusted by the law of demand and supply has wholly changed. A recent writer* illustrates this by reference to some of the great strikes in England, especially the London Dock Strike of 1889, and the Coal Miners' Strike of 1893. The former was one of the most important labor contests of recent times. It arose from the fact that the London docks depended largely on casual labor for the work of unloading vessels. From fifty to one hundred thousand men thronged the docks each day seeking employment. From them the workers were selected, and since the applicants were often men, who had failed in other employments, or were in desperate need of work, there was a fierce struggle to attract the notice of the foreman and secure a job. The work often lasted but a few hours and the pay was meagre. Eager as they were for the work the men sometimes had to stop as soon as they had earned a few pennies in order to satisfy their hunger. The dockers organized a strike in August, 1889, demanding a minimum engagement of four hours, an increase of the wage rate, and other concessions. The strike spread until the docks of London were left without workers and the trade of the port came to a standstill. The dock directors conceded the minimum engagement for four hours, but refused the other demands. In a statement which they made public they showed that if they yielded to the demands of the strikers their business would be seriously injured. To this the men retorted that the companies were ill-managed and that losses due to this cause ought not to be made good at the expense of labor. Sympathetic strikes followed, and at one time it was estimated that 130,000 men were idle. In spite of the claims of the directors that the strike was an organized attack upon all capital the sympathy of the public was largely with the strikers. A compromise was reached in September, 1889, and the general result was decidedly in favor of the strikers. By this the principle of the minimum rate was adopted, and, at the same time, the dependence on casual labor came to an end. This was one of the great triumphs for unskilled labor, and it resulted in promoting organization among that grade of workingmen. The view that wages should follow prices led to many disputes among the coal miners. The high price of coal of 1870-73 made the miners agree to carry out this principle, but when after 1890 the price of coal declined the consequent reduction in the wage rate was not favorably regarded, although it was the logical result of this principle. The miners attributed the small gains of the companies to their mismanagement. Moreover they said that the wage rate which they received was the minimum rate at which they could live. On July 28, 200,000 of the miners were locked out. Again public sympathy was largely with the strikers, and a considerable sum of money was contributed to their cause. The final demands of the men were that wages should be fixed by a board of conciliation, subject to a fixed minimum of 30 per cent. above the rates of 1888. At last a conference was arranged, largely through the influence of Mr. Gladstone, and on November 17 the miners scored a victory. The settlement made no mention of a minimum, but in a subsequent agreement the masters in return for the workingmen's acceptance of a reduction, admitted the principle that wages should be a fixed charge. The following passage, quoted from the writer above mentioned, summarizes the progress made in England during the last ten years by the living wage movement in that country:

"In the early eighties the working classes were divided into three groups: (1) Those whose wages were governed entirely by the law of supply and demand applied to the labor market; (2) those whose wages were determined in some fixed ratio to the price of the product; and (3) an aristocracy of labor whose organization was so powerful and whose strategic position in the labor market, owing to the possession of special skill, was so strong, that they were able to command a high rate of wages and to utilize the fluctuations of trade to their advantage. The great depression of 1886-87 coincided with an outburst of enthusiasm for social reform and economic inquiry, and the first great achievement of the new spirit was to determine, almost by popular acclamation, that wages should be independent of competition in the labor market. The next point to be fought for was the principle that wages should not depend upon prices. As competition among workmen had been set aside, so

* H. W. Macrosty, *The Living Wage Movement*, in the *Political Science Quarterly*, September, 1898.

competition among employers, with its trade-disorganizing results, has since the coal war ceased to be recognized as a reason for reduction of wages. Practically, public opinion now concedes that wages should be a first charge on production."

WAGNER, JACOB, a well-known artist, died in New York, November 5, 1898. He was born in Bavaria, January 27, 1852, and when four years old came to this country with his parents. At twelve years of age he was apprenticed to learn picture-frame making; later he learned the art of restoring paintings, and in 1874 began a systematic study of art at the Lowell Institute and the Art Museum; he attended evening classes, and thus was enabled to continue his trade. In 1883 he went into art as a profession; his first works were landscapes, but later he became interested in portraiture. For a number of years he was represented in all of the more prominent exhibitions in the country and had three pictures at the Chicago Exposition. Mr. Wagner was a member of the Boston Art Club and of the Boston Water-Color Society. He had a wife and three children, and his home was at Dedham, Massachusetts.

WALCOTT, GENERAL CHARLES C., veteran of the Civil War, died at Omaha, Nebraska, May 2, 1898. He was born in Columbus, Ohio, in 1838; after his graduation at the Kentucky Military Institute in 1858 he became a civil engineer. In 1861 he entered the Union service as a major, and for gallantry rose to the rank of brigadier-general of volunteers and brevet major-general. He was with Sherman on the march to the sea, and was wounded at Shiloh, Kenesaw Mountain and Griswoldville. He was a Presidential elector in 1868, and the next year was appointed by President Grant internal revenue collector; he served till 1883, when he was elected mayor of Columbus, being re-elected in 1885.

WALFISCH BAY lies off the coast of German Southwest Africa, by which territory it is wholly surrounded, but belongs to Great Britain. It has an area of 430 square miles, with a population in 1891 of 768. Its importance consists in the fact that it is the chief harbor in that region. Its possession by Great Britain is injurious to German interests, and it has been expected that Great Britain would cede it to Germany in return for important concessions. For instance, it was said by some that it might be used for the purpose of securing to Great Britain a strip of territory in German East Africa that would open her line of communication with British Central Africa through Lake Tanganyika, and thus realize the scheme for extending her empire throughout the entire length of the continent from the Cape to Cairo. To the close of the year 1898, however, nothing occurred to change the status of the colony.

WALLACE COLLECTION, a famous gift of works of art to the British nation by the late Lady Wallace. It is to be permanently placed in Hertford House, Manchester Square, London, in which extensive alterations are now being made for its reception.

WALPOLE, RT. HON. SPENCER HORATIO, retired English statesman, died May 23, 1898. He was born September 11, 1806; was educated at Eton and at Trinity College, Cambridge, from which he received the degrees M.A. and Hon. LL.D. He became a barrister and in 1846 Queen's Counsel; he was Member of Parliament for Midhurst, 1847-56, and for Cambridge University, 1856-86; was Secretary of State Home Department in Lord Derby's three administrations, 1852, 1858-59, 1866-67.

WALSH, MOST REV. JOHN, D.D., Archbishop of the Roman Catholic diocese of Toronto, Ontario, died in Toronto, July 31, 1898. He was born in County Kilkenny, Ireland, May 23, 1830; was educated at St. John's College, Waterford, Ireland, and, having come to Canada in 1852, at the Grand Seminary, Montreal, Quebec; was ordained to the priesthood, November 1, 1854, and was installed rector of St. Michael's Cathedral, Toronto, 1859; three years later became vicar-general of the diocese. In 1867 he was raised to the Sandwich bishopric; the next year the episcopal residence was changed to London, Ontario. On November 27, 1889, he succeeded Archbishop Lynch, of Toronto. Archbishop Walsh was active in the convention which met at Dublin in 1896 to effect unity among the Irish political factions.

WALTHALL, EDWARD CARY, Democratic United States Senator from Mississippi, died in Washington, D. C., April 21, 1898. He was born in Richmond, Virginia, April 4, 1831; was educated and studied law at Holly Springs, Mississippi; having been admitted to the bar in 1852, he began the practice of law in Coffeeville, Mississippi, and in 1856 and 1859 was elected district-attorney for the tenth district. At the outbreak of the Civil War he entered the Confederate Army as a lieutenant in the Fifteenth Mississippi Regiment, and by gradual promotion became a major-general in June, 1864. After the war he continued his law practice, removing to Granada in 1871. He was a member, as delegate-at-large, of the Democratic national conventions of 1868, 1876, 1880 and 1884. Mr. Walthall became a United States Senator from Mississippi in 1885 to fill the vacancy caused by the resignation of L. Q. C. Lamar, whom Mr. Cleveland had chosen as Secretary of the Interior. In the fol-

lowing January he was elected by the legislature for the unexpired term, and was re-elected in 1888 and 1892. In 1894 he resigned on account of ill health, but re-entered the Senate in March, 1895. His term of office would have expired March 3, 1901.

WARD, HAMILTON, jurist, died at Belmont, New York, December 28, 1898. He was born at Saulsbury, New York, July 3, 1829; admitted to the bar in 1851; elected district-attorney of Allegany county, as a Republican, in 1856 and 1862; elected to Congress in 1864 and for the two succeeding terms; in 1879 elected attorney-general of New York. He was a member of the Capitol Commission; as a member of the Land Board he stopped the disposal of public lands at private sales. In 1890 he was appointed a member of the commission to propose amendments to the State Constitution; in May of the next year he was appointed by Governor Hill a justice of the Supreme Court for the Eighth Judicial District, and in September was elected for a full term. When the Appellate Division of the Supreme Court was created in 1895 in pursuance to the constitutional amendment, he was named by Governor Morton to serve in that division.

WARD, MRS. HUMPHRY (Mary Augusta), author, was born in Tasmania June 11, 1851. She is a daughter of Thomas Arnold and niece of Matthew Arnold. In 1872 she was married to Mr. Thomas Humphry Ward. She first wrote historical essays and criticisms; translated *Amiel's Journal* (1885), and published her first novel, *Miss Bretherton*, in 1886. *Robert Elsmere* appeared in 1888; *The History of David Grieve* in 1892; *Marcella* in 1894; *Sir George Tressady* in 1896; and *Helbeck of Bannisdale* in 1898. Mrs. Ward is honorary secretary of University Hall, a settlement among the poor of London, of which she, with the Rev. Stopford Brooke, Dr. Martineau and others, was a founder.

WARING, COLONEL GEORGE E., JR., prominent sanitary engineer, died of yellow fever in New York city, October 29, 1898. He was born at Poundridge, New York, July 4, 1833; was educated in Poughkeepsie, and there took courses in engineering and agriculture. In 1855 his lectures in Vermont and Maine on agriculture attracted attention. For a time he was manager of the experimental farm established by Horace Greeley at Chappaqua, New York, and in 1857-61 he was drainage engineer of Central Park, New York city, and planned the present drainage system of the park. He entered the Union service as major of the Garibaldi Hussars (cavalry); after serving for three months with the Army of the Potomac he was transferred to the southwest, raised a cavalry squadron, and served under General John C. Fremont; later he was made colonel of the Fourth Missouri Cavalry, and remained with this regiment to the end of the war. From 1867 to 1877 he was manager of the Ogden Farm, at Newport, Rhode Island. The next year he came into prominence by changing the sewerage system in Memphis, Tennessee, when an epidemic of yellow fever had broken out in that city; he introduced the separation of house drainage from surface drainage, a system that was afterward widely adopted. Colonel Waring was a member of the National Board of Health for several years succeeding 1882, and in 1894 he became assistant engineer of New Orleans. On December 30 of that year he was selected by Mayor-elect William L. Strong as Street Cleaning Commissioner for New York city, which position he held until the return of the Tammany régime, January 1, 1898. During Colonel Waring's administration the Department of Street Cleaning was thoroughly reformed and reorganized, and its efficiency was highly developed. A strong effort was made in the interests of the city to have him retained, but this the Tammany administration refused to do. On October 8, 1898, President McKinley appointed him head of a commission to investigate the sanitary condition of Havana, with a view of introducing improved methods of sanitation, in order especially to stop the frequent occurrence of yellow fever in that town. Colonel Waring made a thorough investigation and reduced to writing his report and recommendations, which at the time of his death had not yet been submitted to the President. While in Havana he devoted himself especially to the study of plans for perfecting the sanitation of the city and for cleaning out the harbor. He reached New York on October 25, and, though he was ill on the return trip, the disease did not develop until after he reached home, but its progress then was very rapid. Shortly before his death he had been chosen as the candidate of the Citizens' Union or Independent State Party, in the campaign of 1898, for the office of state engineer and surveyor. Colonel Waring was not a partisan in politics, but always used his influence for clean government. See CUBA.

WARSHIPS. For descriptive and statistical matter on the subject of warships, see the paragraphs on *Navy* in the articles on FOREIGN COUNTRIES and the UNITED STATES; also the articles NAVIES, FOREIGN; TORPEDO BOATS; ELECTRICITY ON SHIPBOARD, etc. The following table gives the number, names, dimensions, and former uses of the vessels acquired by the United States Government for use in connection with the war with Spain:

(Reprinted from *Marine Engineering*.)

[illegible]

* Particularly Useful to H. A. Dresden.

WASHINGTON, a Pacific Coast State, has an area of 69,180 sq. m. Capital, Olympia.

Mineralogy.—During the calendar year 1897 all previous records of the State as a coal producer were surpassed, with a total output from 23 mines of 1,434,112 short tons, spot value \$2,777,687. King was the banner county, with a record of 583,488 tons. The yield of the precious metals was, gold, 20,312 fine ounces, value \$419,900, and silver, 106,900 fine ounces, coining value \$138,214. During 1898 there were more miners actively employed in developing mines than at any other time since the discovery of precious metals in the State, and the output of gold alone, \$599,483 in value, exceeded that of gold and silver combined in the previous year. Quarrying in 1897 yielded \$148,864, principally limestone; coking, \$115,754; and the clay industry, \$193,220, almost wholly brick and tile. Late in 1898 it was locally reported that a vast ledge of remarkably rich platinum had been discovered on Mad River in Okanogan county and had been tested with gratifying results.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 68,400 bushels, value \$28,728; wheat, 23,453,043, \$12,664,643; oats, 3,270,002, \$1,308,001; barley, 1,484,978, \$668,240; rye, 42,552, \$24,680; potatoes, 1,554,120, \$606,107; and hay, 526,376 tons, \$4,000,458—total value, \$19,300,857. Live stock comprised, horses, 169,694; mules, 1,441; milch cows, 115,485; other cattle, 265,376; sheep, 759,824; and swine, 156,748—total head, 1,468,568.

Industries.—A new government assay office was opened in Seattle in the summer of 1898, expressly to handle the Yukon and Klondike gold shipments. The State had three extensive smelting works in operation, reducing gold, silver, copper and lead ores, and all were doing a large business. Dairying yielded 2,094,427 pounds of butter and 709,364 pounds of cheese in 1897, a large increase in both products. There were 81 dairies, and shipments out of the State of 174,778 pounds of butter and 112,402 pounds of cheese. The output of the Puget Sound salmon canneries was 494,026 cases. For other details of this industry, see OREGON.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise in the Puget Sound customs district aggregated in value \$5,058,069; exports, \$17,918,692, a decrease in a year of \$2,008,062 in imports and an increase of \$6,055,767 in exports. The movement of gold and silver was, imports, \$5,130,903; exports, \$116,660, making the total foreign trade of the year \$28,224,324, a net increase of \$5,320,885.

Railways.—On January 1, 1898, the total length of all steam railroads in the State was reported at 2,811.91, of which about 10 miles were constructed in the previous year. The mileage of the street railways was about 245. Railroad property was assessed on a valuation of \$20,646,248 for 1897.

Banks.—On October 31, 1898, there were 32 national banks in operation and 45 in liquidation. The active capital aggregated \$3,888,000; circulation, \$1,032,553; deposits, \$13,841,166; reserve, \$5,615,190. The State and private banks, June 30, 1898, numbered 15, and had capital, \$673,780; deposits, \$3,148,649; resources, \$4,217,916. The exchanges at the United States clearing houses at Tacoma, Seattle and Spokane in the year ending September 30, 1898, aggregated \$149,360,628, an increase of \$64,778,704 in a year.

Education.—The last report available at the time of writing was for the school year ending 1896, and showed, school population, 120,563; enrollment in the public schools, 90,113; daily attendance, 63,212; public school houses, 1,890; teachers, 3,245; value of public school property, \$4,837,413; and expenditures, \$1,425,509, including \$769,150 for teachers' salaries. For higher education there were 34 public high schools, 13 private secondary schools, 2 public normal schools, 8 colleges and universities, with 94 professors and instructors, 1,027 students, and \$128,033 income; and the State Agricultural College, endowed by Congress, which received from the Federal government \$22,000 in 1897 and \$23,000 in 1898. The various higher institutions had a total of 39,856 volumes in their libraries. In 1898 the periodicals numbered 213; dailies, 13; weeklies, 170; monthlies, 23.

Finances.—On July 1, 1898, the bonded debt was \$250,000; floating debt, \$1,563,268—total debt, \$1,813,268; tax rate, \$5 per \$1,000. The equalized assessed valuations for 1897 were, real estate, \$167,687,243; personal property, \$37,797,293; railroad property, \$20,646,248—total, \$226,130,784, the highest since 1893.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 475,000. Local estimates gave Seattle 73,000; Tacoma, 50,000; Spokane, 41,000; Walla Walla, 8,260; Everett, 5,000; Vancouver, 5,000. The State is rapidly increasing in population as well as in wealth. In addition to those of whom no record can be kept, 4,500 people have moved into Washington since February, 1898. These came from the New England States, New York and southern New Jersey, and were attracted by the advertising sent out by the Seattle Chamber of Commerce, the railroads, and others interested in fostering the development of this State. They

represented nearly every occupation, but were principally mechanics and farmers. They have been distributed all over the western part of the State.

Legislation and Elections.—The question of general women's suffrage was decided adversely by a large majority. Local option in municipal taxation was also defeated. The title of the Northern Pacific Railroad to nearly 9,000,000 acres of land in Washington is, according to a majority report made to the State legislature, invalid. The legislature will consider the matter with a view to restoring this tract to the public domain.

The vote for the two representatives in Congress in 1898 was: W. C. Jones (Fus.), 33,052 votes; J. H. Lewis (Fus.), 36,385 votes; W. L. Jones (Rep.), 39,809 votes, and F. W. Cushman (Rep.), 38,983 votes.

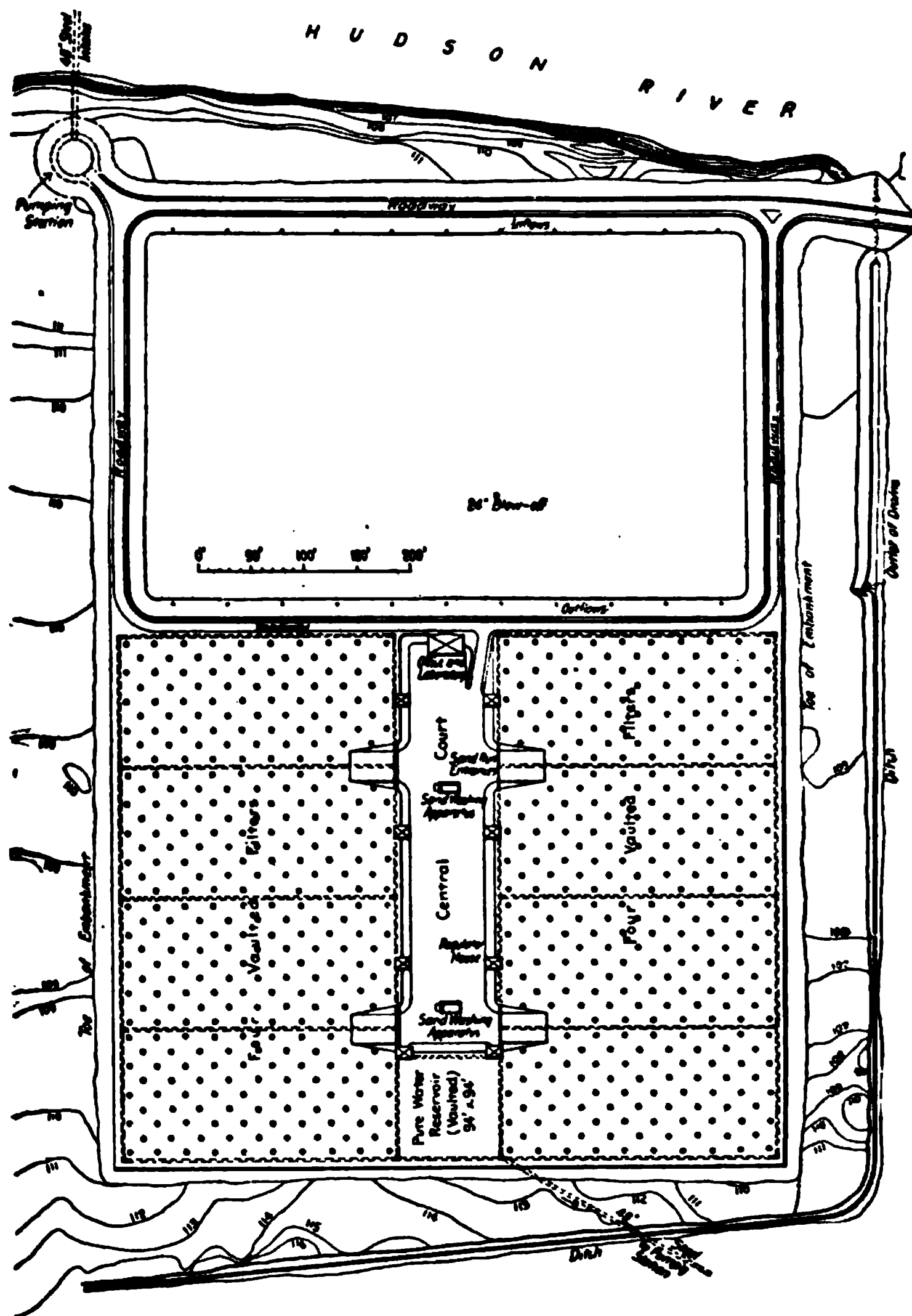
National Representatives and State Officers.—Washington's representatives to Congress are: W. L. Jones (Rep.), from Yakima; and F. W. Cushman (Rep.), from Tacoma. Senators: George Turner (Pop.), from Spokane, and a Republican. Officials: John R. Rogers, Governor (Pop.); Thurston Daniels, Lieutenant-Governor (Pop.); W. D. Jenkins, Secretary (Pop.); C. W. Young, Treasurer (Pop.); Neal Cheatham, Auditor (Pop.); P. H. Winston, Attorney-General (Sil. Rep.); W. J. Canton, Adjutant-General (Pop.), and F. J. Browne (Pop.), Superintendent of Education. Chief Justice, Elmon Scott (Rep.); Associates, R. O. Dunbar (Rep.), M. J. Gordon (Rep.), T. J. Anders (Rep.), J. B. Reavis (Dem.), and Clerk, C. S. Reinhart (Rep.). There are 9 Democrats, 85 Republicans, 17 Populists and 1 member of the Citizens' party in the State legislature.

WASHINGTON ACADEMY OF SCIENCES. See ZOÖLOGICAL SOCIETIES (first paragraph).

WATER POWER. See CANALS (paragraph Water Power).

WATER PURIFICATION. It is gratifying to note, as the end of the century draws near, a growing appreciation of the value of pure water. It has long been a reproach to this country that quantity is so generally placed above quality. While most of our American cities are still wasting more water than they legitimately use many are now becoming aroused to the fact that it is, after all, a vain and idle boast to claim one of the largest per capita water consumptions in the world when at the same time the mortality records show equal supremacy in the typhoid-fever death rate. Not that the heavy use and waste of water causes typhoid fever, but use of impure water does, whether the consumption be high or low, and excessively high consumption often means that so much money is being spent to provide water for wanton waste that none is available for improving the quality. Indeed, to purify such immense quantities of water as some of our cities are making way with is almost a financial impossibility. Improvements in quality proceed along two lines: (1) Prevention of pollution by sewage, and (2) purification works to remove such pollution as cannot be, or is not, prevented. The first is principally legal, though partly engineering in its efforts; the second is wholly a matter of engineering, chemistry and biology. Legal actions proceed along the line of exercising the police power to prevent the perpetration of nuisances and direct menaces to health. Perhaps it is most effective where the State stands as conservator of the purity of inland waters, by directly prohibiting the discharge of sewage or human excreta within specified distances of water-works intakes, and also where the State requires all plans for water supply and sewage disposal to be approved by the State Board of Health before execution. One or both these plans are now followed in Massachusetts, New York and Ohio. In addition, Massachusetts has for years expended large sums of money in experimental researches on the purification of water by slow sand filtration. It has amply demonstrated, and experience elsewhere, both at home and abroad, corroborates the fact, that even polluted water can be purified at the rate of from 1,500,000 to 5,000,000 gallons an acre a day by passing it through properly constructed filter beds of sand. Or it may be purified by mechanical filtration, as described below. What will be the largest water-filtration plant in America will be put in operation during 1899 at Albany, New York, Mr. Allen Hazen, of New York city, acting as consulting engineer. It will have a daily capacity of 15,000,000 gallons and will include the following: Eight masonry vaulted or covered filter beds with an effective area of about 0.7 acres each; a 16,000,000-gallon sedimentation reservoir, for removing mud in suspension before the water goes to the filters; a 600,000-gallon clear covered water reservoir, a sand-washing apparatus, bacteriological laboratory, piping and other appurtenances. There will also be a centrifugal pumping plant to lift the water from the Hudson River to the sedimentation reservoir. From this reservoir it will pour by gravity through the filter beds, clear-water reservoir and then through a steel pipe line 48 ins. in diameter and 8,000 ft. long to the present pumping station. The filtering material will consist of 4 ft. in depth of sand, resting on 1 ft. of gravel and broken stone. Not more than 1 per cent. of the sand by weight shall be less than 0.13 mm. in diameter and at least 70 per cent.

must be less than 1 mm. in diameter, while none of the particles shall be more than 5 mm. in diameter. The contract for the plant, exclusive of the steel pipe-line pumps and pumping station, was awarded for about \$310,000. At Kansas City, Kansas, and Norfolk, Virginia, contracts were closed in 1898 for 6,000,000-gallon water-purification plants of a widely different type from those at Albany. These are known as mechanical filters. Filters of this class operate at such high rates as 100,000,000 to 120,000,000 gallons an acre, this being made possible by the use of



PLAN OF SEDIMENTATION BASIN, COVERED FILTER BEDS AND CLEAR WATER RESERVOIR
ALBANY, N. Y.

(From *Engineering News*.)

sulphate of alumina to coagulate and precipitate the suspended matters in the water, including the bacteria. These matters are retained on the surface and in the midst of the filtering material, which is generally sand. When the filters become clogged as they do in from a few hours to a day, they are washed by reversing the current and by agitating the sand by means of revolving rakes, moved by machinery. This action, together with the fact that the whole process is mechanical, rather than

biological, gives rise to the name mechanical filtration. In slow sand filtration, it should be added, the purification is effected by bacterial action, the bacteria in the filter beds oxidizing the organic matter in the water, and thus robbing the pathogenic bacteria of their food, while at the same time a sticky coating forms on the sand grains and catches and retains the bacteria which it is desired to remove from the water. Careful and extended observations show that an average of from 97 to 99.5 of the bacteria can be removed from water by either slow sand or mechanical filtration. Recent extended experimental investigations at Louisville, Kentucky, and Cincinnati, Ohio, on Ohio River water, and at Pittsburg, Pennsylvania, on Monongahela River water, show that with very turbid waters it may be highly advantageous to provide large settling basins for the removal of a part of the suspended matter. The Louisville experiments were wholly with mechanical filters and electrical methods of treating water. The latter were found to be impracticable, or at least not as advantageous for use at that place as mechanical filtration. At Pittsburg, both mechanical and slow sand filtration were studied side by side, the latter both with and without previous sedimentation and the former with only the slight sedimentation provided in connection with the mechanical filters. The Pittsburg tests showed remarkably good results for both systems of purification, but the commission in charge decided that sedimentation and slow sand filtration would be cheaper and more efficient than mechanical filtration. This was partly due to the fact that an essential to the use of the coagulant employed in mechanical filtration, sulphate of alumina, is the presence of lime in the water to be filtered, to neutralize the sulphuric acid in the sulphate of alumina. At times the water of the Allegheny is quite low in lime contents, and often this occurs just when the water is most turbid and requires most coagulant for its removal. A report has recently been made on the Cincinnati experiments, recommending the construction of a mechanical filter plant, the water to be settled in large reservoirs before filtration. The estimated cost of treating the water was about \$10 per 1,000,000 gallons, including capital charges. This agrees quite closely with the estimates for treating the Allegheny River water at Pittsburg. Mr. George W. Fuller was chief chemist and bacteriologist of the tests at Louisville and Cincinnati, while those at Pittsburg were conducted under the direction of Mr. Hazen, already mentioned.

The mechanical filter plant at Norfolk, Virginia, mentioned above, includes 12 combined settling and filter tanks, made of wood, the settling compartments being beneath the filters proper. The outside dimensions of each tank are 16½ ft. in diameter and 16 ft. high, and the available filtering area of each tank is 172 sq. ft. The settling compartment is 16 ft. in diameter and 7 ft. high. The filtering material is 4 ft. deep, composed of a mixture of two-thirds sand and one-third crushed marble, some 0.35 to 0.45 mm. in size of grain. There is a 22 H. P. engine for driving the agitators, or revolving rakes, used to help wash the filtering material. Two 8,000,000-gallon centrifugal pumps are provided for lifting the water to the filters, one being for use in case of emergency. The plant is housed by a two-story brick building, about 60 x 180 ft. in plan. The plant is designed to remove color, taste and suspended matter, and the contractors, the New York Filter Manufacturing Company, guaranteed to remove 97 per cent. of the bacteria in the applied water, when 7,000 per cu. cm., or more, were present, and when the original number is less than 7,000 to reduce them to 100 per cu. cm.

At the beginning of 1899 there were some 15 to 20 slow sand filtration plants connected with public water-works in the United States and Canada, and about 135 mechanical filter plants. The majority of the latter were put in to clarify water, rather than to remove bacteria. Besides the removal of bacteria and turbidity from water, filtration, aeration, or a combination of these, are sometimes employed to remove iron, color, tastes and odors, or the organisms giving rise to tastes and odors.

WATER TOWERS. See WATER-WORKS.

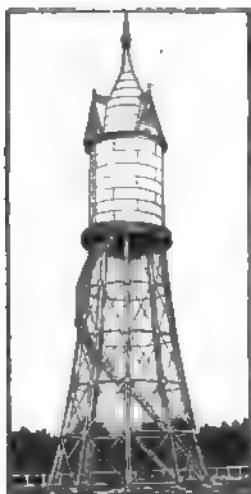
WATER-WORKS. Few towns in the United States with 5,000 population or over are without water supplies for domestic use and fire protection, while hundreds of places of less size are so provided. The latest available statistics show that early in 1897 there were 3,200 water-works in the United States and 145 in Canada. Besides these there were scores of plants furnishing only a partial service, and many of the complete works supplied from 2 to 20 towns each. Slightly more than half of the full works, and three-fourths of the population served, were under municipal ownership.

Artesian wells used for the public water supply of Indianapolis, Indiana, were tested for capacity in 1898, under the direction of John W. Hill, of Cincinnati, Ohio. The normal total yield of 25 wells was about 18,700,000 gallons per day. Of these wells 20 are 10 inches and 5 are 8 inches in diameter. Their average depth is about 300 feet. They form one of the most notable group of artesian wells used for a public water supply in this country. Another notable group of artesian wells fur-

nishes the water supply of Memphis, Tennessee, and was reported on in 1898 as to permanency of supply by Mr. John Lundie, of Chicago. These wells have been used many years, but are still, according to his report, yielding an abundance of good water.

A large driven-well plant was completed in 1898 for the water supply of Camden, New Jersey. The contract provided for a daily supply of 20,000,000 gallons, but on the city assuming control and operating the plant at the beginning of 1899 the indications were that the actual yield, after continued pumping, would be about 16,000,000 gallons. There are 103 wells, 10 to 6 inches in diameter, with strainers averaging 24 feet in length. Some draw from a stratum 50 to 70 feet deep and the balance from a stratum 90 to 125 feet deep. In most of the wells the water rises high enough by its own pressure to flow to the pump well, but a few require the aid of air-lift pumps. The contract price for this work was \$561,500, but this included, besides the wells and suction pipe, a 20,000,000-gallon pumping station complete and 19,280 feet of 36-inch and 4,217 feet of 30-inch force main, to connect with old distributing system of the water-works.

Driven wells are used by many cities as sources of public water supply. In April, 1898, the city of Lowell, Massachusetts, accepted from the contractor the third group of driven wells sunk since 1891, which brings the total capacity of such wells at Lowell up to some 10,000,000 gallons a day. The actual amount of water pumped from these wells in 1898 averaged 6,569,000 gallons a day. More might have been drawn from them had it been needed. During one week in the winter about 9,000,000 gallons a day was pumped from the wells. In the three groups at Lowell there are a total of 389 wells, from 6 to 2 inches in diameter. The latest group includes 169 wells, 2½ inches inside diameter, 27 to 40 feet deep. The water-bearing stratum is about 25 feet below the surface and 5 to 15 feet deep. The wells were sunk by driving iron pipe into the ground, the lower end of which had a point, above which the pipe was perforated with numerous small holes to make the strainer. These wells are connected to a suction pipe 2,056 feet long, increasing in diameter from 6 to 20 inches, as wells are added. On each length of suction pipe (12 feet) is cast a 2½-inch branch connection, at an angle of 45 degrees. Into these branches are screwed 2½-inch pipes, with gates for shutting off each well. Next comes a piece of lead pipe about 3 feet long, which is joined to still another iron pipe extending to the top of the well. The short section of lead pipe affords an easy means of correcting any errors in grade or alignment, as it can be bent readily. The three groups of wells cost about \$265,000, or some \$265,500 per 1,000,000 gallons of daily capacity. The substitution of the water from these wells for that previously drawn from the Merrimac River, which is polluted with sewage, has been accompanied by a material reduction in the typhoid-fever death rate. The well water is harder than that from the river, but not hard enough to



ELEVATED STEEL WATER TANK WITH CURVED BOTTOM, JACKSONVILLE, FLORIDA.

(From *Engineering News*.)

make it undesirable. The wells were sunk under the direction of Mr. Geo. Bowers, City Engineer of Lowell.

Meters.—As has been indicated under WATER PURIFICATION, means to prevent waste is often a necessary accompaniment of purification. It is also imperative in many other instances. The most effectual way to prevent waste, or to make each consumer pay for the water he wastes and uses, is to sell water by meter measurement. There is now a strong move in this direction among water-works officials. The flow of water in large conduits is now being measured at many works by the Venturi meter, a device consisting of a length of pipe contracted in diameter. The contraction effects a slight reduction in pressure, which varies with the amount of water flowing through the pipe. By means of a registering apparatus the difference in pressure on each side of the contraction is converted into the corresponding quantities of water flowing through the pipe.

Pumps of large size, and sometimes of high duty, are a marked feature of current practice. At Boston the Metropolitan Water Board was, in the latter part of 1898, erecting a 30,000,000-gallon high-duty and three 35,000,000-gallon low-duty pumping engines. At Cincinnati, three 30,000,000-gallon pumps will be used in connection with the new supply.

At the other extreme, very small pumping plants, with gasoline and electric power, are being installed to supply small villages with water. They require little attendance.

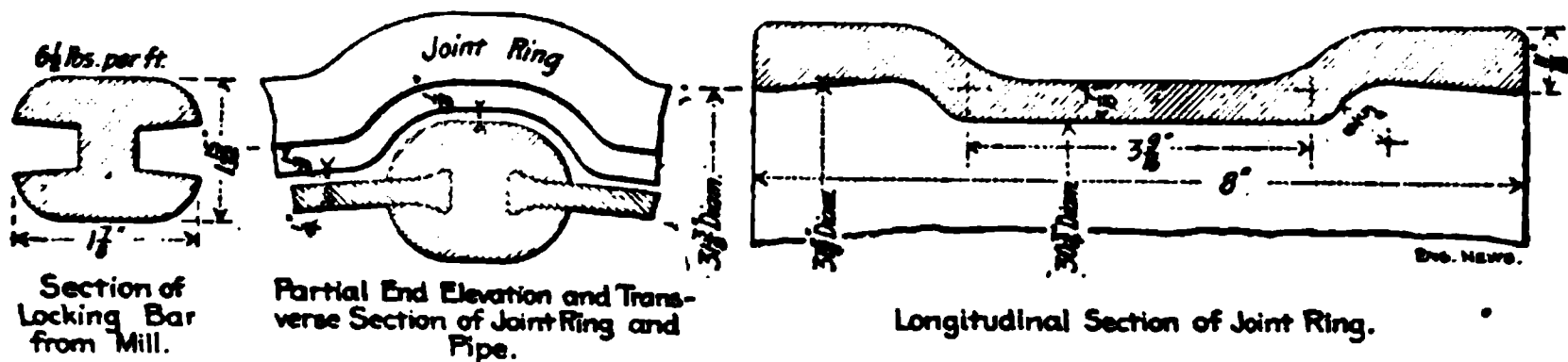
can be instantly shut off without waste of fuel or power, while the electric pumps may be arranged to start and stop automatically, according to the demand for water.

Air-lift pumps are rapidly coming into use for lifting water from deep wells. They have no working parts in the well to get out of order, the only requirement being an air pipe inserted in the well and the forcing of compressed air into the water in the well. The air comes to the surface, bringing water with it.

Reservoirs are being covered where exposure to light develops organisms giving rise to bad tastes and odors in the water. This was done in 1898 at Quincy, Illinois, where timber was used for the roof. At Rockford, Illinois, Brookline and Waltham, Massachusetts, and other places arched masonry roofs have been employed. Asphalt linings have been used for a number of reservoirs, both in original construction and to stop subsequent leaks. The most notable instances of the latter are at Philadelphia.

Stand-pipes and water tanks are now being made almost exclusively of steel, rather than wrought-iron, and the latter, when elevated, are often built with conical or spherical bottoms, the whole supported on steel trestles or framework, in many instances. Some elevated tanks are supported on and some stand-pipes are enclosed with stone or brick masonry, in which case they are often called water-towers. At Racine, Wis., an old stand-pipe was recently enclosed with brick. Small elevated tanks are often made of wood.

Among the most notable pieces of water-works construction now in progress, besides those already mentioned, are the new Croton Dam (see DAMS); the Metropolitan Water System for Boston and vicinity; new lake tunnels at Cleveland and Chicago; a new supply for Cincinnati, and the Coolgardie Works, Western Australia.



DETAILS OF LOCKING BAR AND RING JOINTS FOR THE COOLGARDIE STEEL PIPE LINE, WESTERN AUSTRALIA.

(See PIPE LINES.) The Metropolitan Water System was put in use early in 1898, but it is only partially completed. It includes nearly the whole of the former Boston water-works, excepting the distribution system within the city limits, and new storage reservoirs, aqueducts and pumping stations designed to supply water from the Nashua River at Clinton, where an immense dam and storage reservoir is to be built, the latter with a capacity of about 60,000,000,000 gallons. This reservoir will blot out a large part of two towns and destroy the water power of some gingham mills employing about 2,500 hands. Damages of about \$500,000 have been paid on account of the mills alone. Mr. F. P. Stearns is chief engineer of the Metropolitan Water Board. The Cleveland water-works tunnel will be 26,000 feet long, 9 feet inside diameter, and terminate in a crib in Lake Erie in 49 feet of water. The tunnel is being lined with brick. The intake crib is of steel plates, with an outside diameter of 100 feet, and a well in the center 50 feet in diameter, the space between the two cylinders being divided by radial partitions of steel plates into 24 water-tight bulkheads, all properly braced and filled in with stone. Ports and conduits through the bulkheads admit water to the central well, which connects with a shaft leading down to the tunnel. The steel plates of the crib are $\frac{3}{8}$ -inch thick. The crib has a timber bottom and there is a superstructure over the well, in which the keeper will live. The tunnel will have an estimated capacity of 170,000,000 gallons a day and will convey water to pumps on the shore. Two bad gas explosions, killing many workmen, occurred in the tunnel in 1898. The work will not be completed, probably, before 1900. Mr. M. W. Kingsley is engineer and superintendent of the Cleveland Water-Works. The Chicago intake tunnels include a number of miles of conduits, some far below the surface of the lake and others beneath the city, connecting the pumping stations. The new water supply for Cincinnati will be taken from the Ohio River, some miles from the city, and the works are being built with the proceeds of a \$6,500,000 loan. They include a river intake crib, a tunnel from this to shore shaft and a 90,000,000-gallon pumping station, large settling reservoirs, a filter plant, clear-water basin and a conduit some 23,000 feet long to a second new pumping station in the city. See DAMS, FIRE PROTECTION, PIPE LINES, SANITARY LEGISLATION and WATER PURIFICATION.

WATER-WORKS ASSOCIATION, AMERICAN, founded in 1880, held its 18th annual meeting in Buffalo, New York, June 14-18, 1898, with John Caulfield, of St. Paul, presiding. A paper was read on early methods of collecting, storing and distributing water, by William B. Hill, of Syracuse, and one on water meters and rates, by John B. Heim, of Madison, Wisconsin. An excursion took place to Niagara Falls, the association visited the Cataract Construction Company, and a banquet was held in Syracuse. There are now 355 members. Joseph A. Bond, of Wilmington, Delaware, was elected president, and Peter Milne, of New York, secretary. The next meeting will be held in Detroit in 1899.

WATTS, GEORGE FREDERICK, painter, was born in London, February 23, 1817. He first exhibited at the Royal Academy in 1837. In 1843 his "Caractacus Led in Triumph through the Streets of Rome" gained a prize of £300 at Westminster Hall, and in 1846 his "Echo" and "Alfred Inciting the Saxons to Prevent the Landing of the Danes" received £500. He became a member of the Royal Academy in 1867. Twice he refused the offer of a baronetcy, in 1886 and in 1894. His paintings of ideal and mythological subjects, such as "Love and Death," "Fata Morgana," "Endymion," "Daphne," "Orpheus and Eurydice," etc., have given him a world-wide fame. In 1895 he gave the National Portrait Gallery fifteen oil portraits and two drawings. "Love Triumphant" was exhibited in 1898. See PAINTING.

WATTS-DUNTON, THEODORE, author, was born in St. Ives, England, in 1836. He received a private education at Cambridge, and was first trained for a naturalist. Studying law, he was called to the bar in 1863. His sonnets attracted the attention of Rossetti, under whose influence he studied art in Italy. Returning to London, he became one of the most influential literary and art critics of the day, being on the staff of the *Examiner* and the *Athenaeum*. He is a devoted follower of Rossetti, whom he has depicted as D'Arcy in his famous novel, *Aylwin* (1898), one of the books of the year. Mr. Watts-Dunton is also a friend of Swinburne, with whom he has lived for years at The Pines, Putney. He has also published *Jubilee Greeting at Spithead to the Men of Greater Britain* (1897), and *The Coming of Love* (1897).

WEINGARTNER, FELIX, conductor, was born in Zara, Dalmatia, June 2, 1863. He studied in Graz and Leipzig, and obtained a scholarship from the Austrian Government in 1881. Liszt had his opera *Sakuntala* produced in Weimar in 1884. He has been conductor in Königsberg, Danzig and Hamburg. In 1891 was court conductor in Berlin. His opera *Malawika* was represented in Munich in 1886, and he has composed many songs and orchestral works. He appeared in several European cities in 1898. See MUSIC.

WELLESLEY COLLEGE, in the town of Wellesley, Mass., was established in 1875. It is non-sectarian and for women only. The one baccalaureate degree conferred is that of Bachelor of Arts, for the attainment of which the study of Latin, but not that of Greek, is required. The course is largely elective. For the year 1898-99 the officers of instruction numbered 79; the student enrollment was: Graduate students, candidates for the M.A. degree, 25; seniors, 131; juniors, 134; sophomores, 135; freshmen, 211; special students, 21; total, 657. In 1898 the degree of M.A. was conferred on 7 candidates and that of B.A. on 146; two certificates were granted, one in music and one in science.

WELLS, DAVID AMES, LL.D., scientist, economist and public financier, died at his home in Norwich, Connecticut, November 5, 1898. For two years he had suffered a general breaking down, and his death, although hastened by a cold, was not unexpected. A direct descendant of Thomas Wells, Governor of the Colony of Connecticut from 1655 to 1659, he was born in Springfield, Massachusetts, June 17, 1828. Having been graduated from Williams College in 1847, he became in the following year a member of the editorial staff of the *Springfield Republican*. It was about this time that he invented a newspaper and book-folding machine. Having entered the Lawrence Scientific School (Harvard) as a special student under Louis Agassiz, he was graduated in 1851, and became an assistant professor; in the meantime (1849) he began with George Bliss the publication of *Annals of Scientific Discovery*, which continued until 1866. During 1857-58, while he was a member of the publishing firm of G. P. Putnam and Company, New York city, he wrote several text-books, including *Elements of Natural Philosophy*, *Science of Common Things*, *Principles and Applications of Chemistry* and *The First Principles of Geology*. In the early sixties Mr. Wells became an authority on the subject of taxation, and in 1863 made himself famous by the publication of a monograph entitled *Our Burden and Our Strength*. So exhaustive was his treatment of the subject and so clearly did he establish hopeful conclusions, that the essay had considerable influence in restoring confidence in the credit of the Government. It was published in England, Germany and France, and its total circulation was thought to exceed 200,000 copies. Upon the completion of his work as chairman of a Congressional commission to make inquiry

into the means of raising revenue after the war, he was made in 1866 Special Commissioner of the Revenue, the office being created for him. While in this position he brought about a reconstruction of the internal revenue laws, the use of stamps on liquors and tobacco, and the institution of the Bureau of Statistics of the Treasury Department. At the time of his visit to Europe in 1867 for the investigation of industries competing with those in America, he was a protectionist, but this experience changed his views, and thereafter he was one of the most ardent advocates of free trade. "I was a staunch protectionist," he said, "but the discovery that just in proportion as wages decreased the demand for protection to domestic industries and the dread of British competition increased, and that the taxation in the United States of the crude materials of manufactures went far to neutralize the benefits accruing from the invention of labor-saving machinery, converted me." It is not improbable that this change of economic faith was an important cause for his retirement at the expiration of his term in 1870 from the office of Commissioner of Revenue, but he was straightway appointed chairman of a commission to investigate the tax laws of the State of New York. He became in 1872 a lecturer on political science at Yale, and wrote, at this time and subsequently, many monographs on economic subjects. He was a delegate to the Democratic national conventions in 1872 and 1880; in 1876 and in 1890 he was nominated for a seat in Congress, but was defeated at both times. In the former year (1876) he received an appointment from the United States Court to be one of the trustees and receivers of the Alabama and Chattanooga Railway, which he saved from bankruptcy. In 1877 he was appointed by the New York State Board of Canal Commissions chairman of a commission to investigate the canal tolls, upon which subject he submitted an exhaustive report the following year. He was one of the reorganizers of the Erie Railway; in 1879 he received an election from the Associated Railways of the United States to membership in the board of arbitration, established for the settlement of questions of pooling, division of earnings, etc. Mr. Wells took an active interest not only in economic, but in political questions; he frequently advised the framers of the Mills and Wilson tariff laws, and during each of the three campaigns of Mr. Grover Cleveland made many speeches for the Democratic party. In 1873 he was invited to deliver the annual address before the Cobden Club, the next year he was elected a foreign associate in political science to the French Academy, taking the chair made vacant by the death of John Stuart Mill. He was also elected in 1877 to a similar position by the Italian Academia dei Lincei. He received in 1863 the degree of M.D. from the Berkshire Medical College; in 1871 his alma mater conferred upon him the degree of LL.D., and in 1874 he received a D.C.L. from Oxford. From 1875 to 1879 he was president of the American Social Science Association, in 1880 of the New London Historical Society, and in the following year of the American Free Trade League. Mr. Wells was twice married; he was survived by his second wife and a son, David Dwight, who at one time was assistant secretary of legation at London. Mr. Wells wrote much for periodicals, especially *The Popular Science Monthly*. Among his books and pamphlets are the following: *The Creed of Free Trade* (1875), *Production and Distribution of Wealth* (1875), *Robinson Crusoe's Money* (1876), *The Silver Question* (1878), *Why We Trade and How We Trade* (1878), *Our Merchant Marine—How it Rose, Increased, Became Great, Declined and Decayed* (1882), *A Primer of Tariff Reform* (1884), *Practical Economics* (1885), *A Study of Mexico* (1887), *A Short and Simple Catechism* (1888), *The Relation of Tariff to Wages* (1888), *Recent Economic Changes* (1889).

WELLS, H. G., novelist, was born in Bromley, England, September 21, 1866. In 1881-83 he was a draper's apprentice; in 1883-84, junior master in a school; in 1884-88, he studied at the Royal College of Science, and in 1894-96 was on the staff of the *Saturday Review*. He is the author of a *Text-Book of Biology* (2 vols., 1892-93); *Select Conversations with an Uncle* (1895), *The Time Machine* (1895), *The Stolen Bacillus and Other Stories* (1895), *The Wonderful Visit* (1895), *The Island of Dr. Moreau* (1896), *The Wheels of Chance* (1896), *The Invisible Man* (1897), and *The War of the Worlds* (1898). He has also written a book of essays, entitled *Certain Personal Matters* (1897).

WELLS. See WATER-WORKS (paragraphs Artesian Wells and Driven Wells).

WESLEYAN METHODIST CONNECTION OF AMERICA shows increase of membership in some of the Southern States and in Canada during 1898. It now consists of 470 churches, 600 ministers, 16,500 members, 396 Sunday-schools, 16,300 scholars, and its church property is valued at \$450,000. The headquarters are at Syracuse, New York, and its 26 conferences lie principally in the North and West. A new conference was organized in Canada in 1898. The missionaries in Africa were forced from the Soudan, but their work will be continued.

WESLEYAN UNIVERSITY, at Middletown, Conn., was founded in 1831, is controlled by the Methodist Episcopal denomination, and since 1872 has been co-edu-

cational. In undergraduate work it offers three courses of study—the classical, the Latin-scientific and the scientific. In these courses the studies for the first year are almost entirely prescribed, but during the three remaining years the amount of elective work is progressively increased. For the year 1898-99 the officers of instruction numbered 35; the student enrollment was: Graduate students, 7; seniors, 65; juniors, 68; sophomores, 78; freshmen, 104; special students, 9; total, 331. The library, for the maintenance and enlargement of which the income of \$30,000 is used, comprised about 54,000 volumes. The following degrees were conferred in June, 1898: B.A., 38; Ph.B., 17; B.S., 9; M.A., 4; M.S., 1; and the honorary degrees, M.A., 2; D.D., 3; LL.D., 2. The president is Rev. Bradford Paul Raymond, D.D., LL.D. See UNIVERSITIES AND COLLEGES.

WEST, GENERAL JOSEPH RODMAN, former United States Senator from Louisiana, died at his home in Washington, D. C., October 31, 1898. He was born in 1823; studied at the University of Pennsylvania, but left before graduation to serve as captain of volunteers in the Mexican War. He went to California in 1849 and engaged in business. At the outbreak of the Civil War he entered the army as lieutenant-colonel of the First California Infantry, and served in Arkansas, New Mexico and other sections of the Southwest. In 1862 he was appointed brigadier-general, and when mustered out he was a major-general by brevet. Having settled in New Orleans after the war, he served there as chief deputy United States marshal and auditor of the customs. General West was elected United States Senator, as a Republican, from Louisiana, and served the full term beginning in 1871. Subsequently he removed to Washington, engaging there in business, and from 1882 to 1885 acting as commissioner of the District of Columbia.

WEST AFRICA. The leading power in Western Africa is France. Her territory extends from the Mediterranean to the Gulf of Guinea, and beginning with Algeria and following the coast, the French line is interrupted only by Morocco, the Spanish possession called Rio d'Oro, the British indentations of Gambia and Sierra Leone, the small block known as Portuguese Guinea and the free State of Liberia. From the Ivory Coast on the Gulf of Guinea the French territory extends in an unbroken line to Algeria on the Mediterranean. France again secures access to the coast in Dahomey on the Gulf of Guinea and in French Congo on the coast of Lower Guinea. For some details in regard to the French possessions of West Africa see the following topics: SENEGAL, FRENCH SOUDAN, FRENCH GUINEA, IVORY COAST, DAHOMEY and FRENCH CONGO.

The British possessions of West Africa were formerly confined to a very narrow area, but in the last thirty years have been greatly extended. They now include GAMBIA, SIERRA LEONE, LAGOS, the NIGER COAST PROTECTORATE and the NIGER TERRITORIES, for an account of which see the articles under these titles.

Portugal holds PORTUGUESE GUINEA south of the British colony of Gambia, Prince's and St. Thomas islands and the extensive tract called ANGOLA.

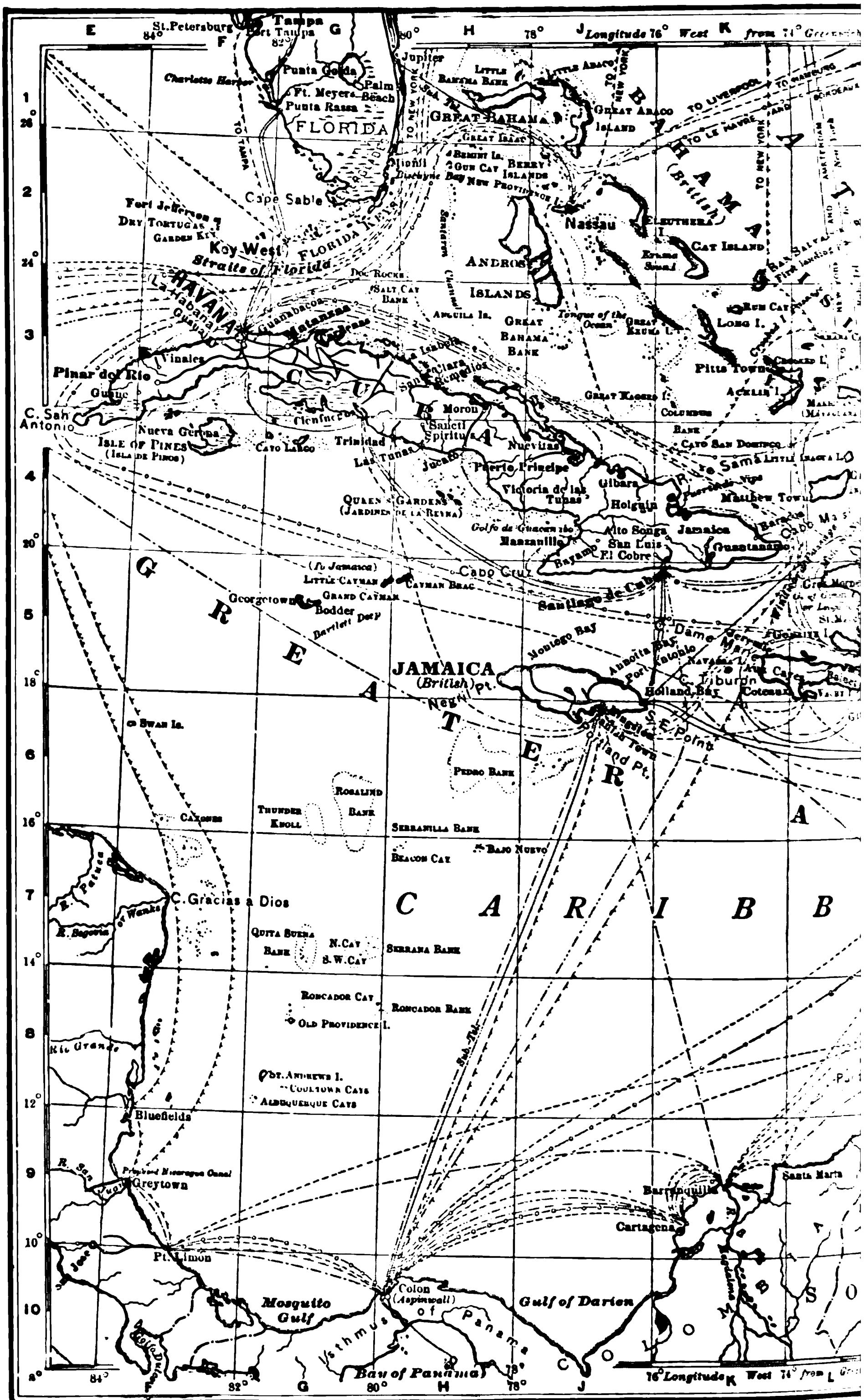
Germany has TOGOLAND and the CAMEROON on the Gulf of Guinea and GERMAN SOUTHWEST AFRICA on the coast to the north of Cape Colony and south of Angola.

Spain retains the strip of coast lying to the southwest of Morocco and known as RIO D'ORO, also the station of Infi and the islands of Fernando Po, Annaboni, Corisco, Elobey and San Juan.

WEST AFRICA, BRITISH. The possessions of European nations on the western coast of Africa originated in the desire to profit from the slave trade in the negroes on the Guinea coast. The British trade in slaves began in the reign of Elizabeth and lasted down to the 19th century. The settlements founded on the coast by Europeans were established merely for this purpose, and accomplished little toward the development of the country. After the slave trade with the Guinea coast was suppressed in 1808 the European interest in that dominion languished, but later it was again used as a source of profit through the trade in alcoholic liquors. France, Germany and England all renewed their rivalry on this coast, and most of it is accordingly divided among these Powers. At present the British possessions in West Africa include the following colonies or protectorates:

1. The Gambia, which lies between Senegal and French Guinea.
2. Sierra Leone, between French Guinea and Liberia.
3. The Gold Coast, between the Ivory Coast (French) and Togoland (German).
4. Lagos, between Dahomey (French) and the Niger Territories.
5. The Niger Coast Protectorate, extending eastward from Lagos to the Cameroen (German).
6. The Niger Territories, belonging to the Royal Niger Company, and stretching far into the interior from Lagos and the Niger Coast Protectorate.

These possessions of Great Britain are not so important or so valuable as those which she holds on the eastern coasts. Yet their revenue is considerable, and they have shown signs of advancement in recent years. The British settlers are, for the



WEST INDIES

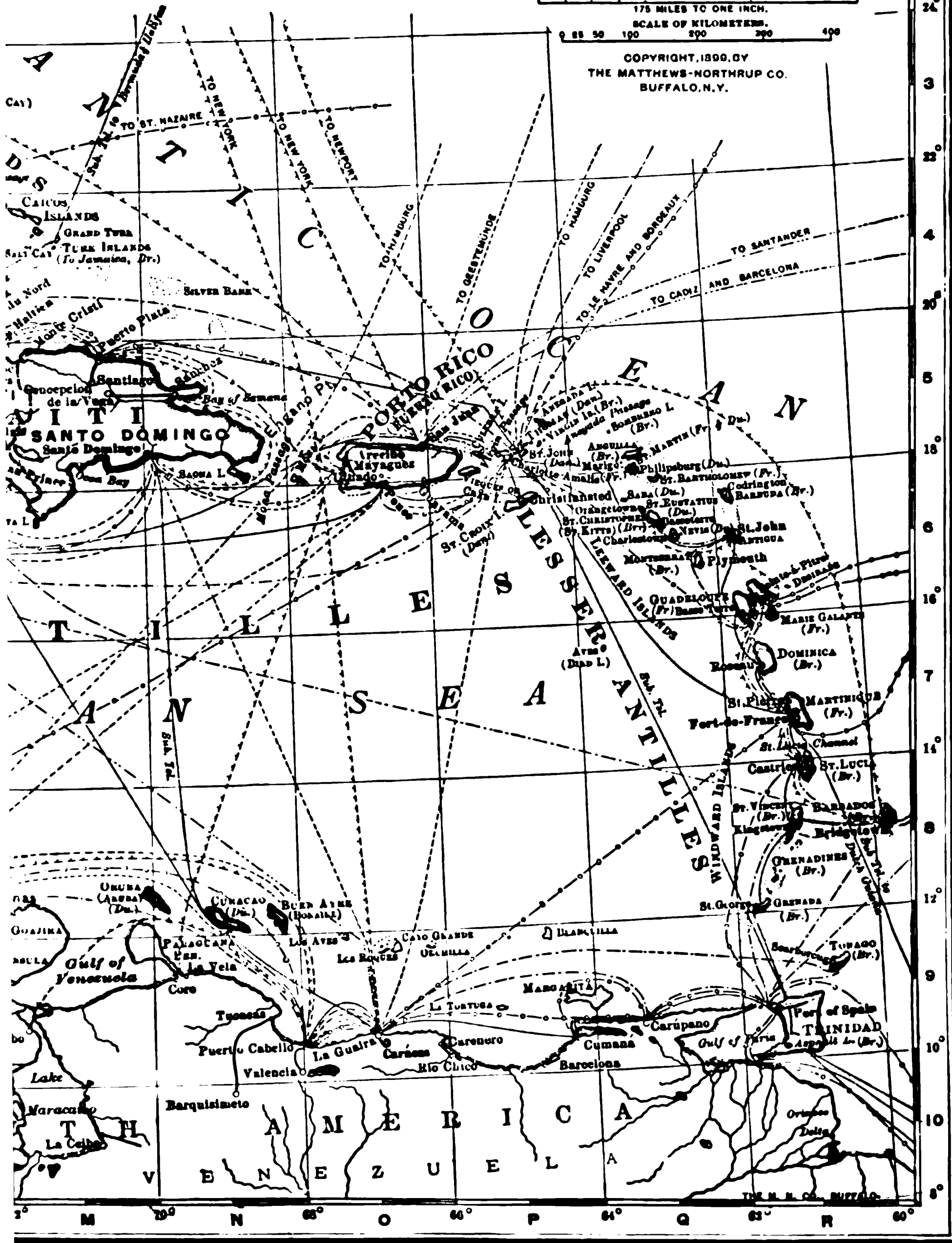
Mail Steamer Lines:

United States: - - - - -
British: - - - - -
French: - - - - -
Spanish: - - - - -
German: - - - - -
Dutch: - - - - -

Capitals of Countries: ● Capitals of Colonies ●
Railroads: — Submarine Telegraph Lines: —

SCALE OF ENGLISH STATUTE MILES
0 50 100 200 300
175 MILES TO ONE INCH.
SCALE OF KILOMETERS.
0 50 100 200 300 400

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most part, officials, traders and missionaries, for the climate does not permit permanent residence. A more detailed description of each of these colonies will be found under their respective heads.

WEST INDIES are a large archipelago extending from the Florida coast nearly to the coast of South America; the total area is about 92,270 square miles and the population is estimated at about 5,000,000. The chief product is sugar, but tobacco and coffee are also important, and of late years attention has been given to other industries, including cacao, molasses, woods, rum, vegetable, fibres, tortoise-shell, sponges, hides and tropical fruits. The soil in general is very fertile, especially in the large islands of Cuba, Haiti, Porto Rico and Jamaica; but manufacturing industries are not far advanced. Excellent cacao is produced in Trinidad; Porto Rico and Haiti are famous for their coffee, and Cuba for its fine tobacco. The trade between the West Indies and the United States is constantly increasing. The following statistics published by the United States Treasury Department show the commerce with the United States for the fiscal year 1896-97:

West Indies.

	Imports.	Exports.
British	\$12,285,885	\$7,808,493
Danish	367,289	519,448
Dutch	96,343	649,971
French	9,944	1,665,461
Haiti	1,460,220	3,554,433
Santo Domingo	2,369,424	1,045,037
Spanish—		
Cuba	18,406,815	7,599,757
Porto Rico	2,181,024	1,964,850

The ports of the West Indies are generally very good; in some of the islands there are good wagon roads, and in the Dominican Republic, Porto Rico, Trinidad, Jamaica and Barbados there are short lines of railway, while in Cuba many of the principal cities are connected by rail. Many steamship lines touch at the various ports both in the larger and the smaller islands. Many who are interested in West Indian commerce are desirous for the reconstruction of the American merchant marine, for at present the foreign trade is chiefly carried in European ships. It is obvious that with some effort American goods carried in American ships could almost monopolize the West Indian trade; in 1897, 90 per cent. of the foreign trade with Cuba was with the United States, while at the same time the latter country received nearly half its cigars, nearly all of its tobacco, and, in 1895, of the 832,431 tons of sugar exported America received 769,962 tons. The majority of the exports of the British West Indies also goes to the United States, from which country they receive almost all of their necessary imports. In the latter part of 1896 Mr. Eckford, the American Consul at Kingston, said: "During the past few years there has been a steady increase in the imports from the United States to this island, which, judging from all appearances, is likely to develop still further." During the fiscal year 1895-96 1,168 vessels cleared from the ports of Jamaica, 698 being steam and the remainder sailing craft; of the entire number 162 were American, having a tonnage of 75,052, which was an increase of 35,712 over the previous year. In 1896, 33.9 per cent. of the total imports of manufactured articles to Jamaica came from the United States, and of the importations of food stuffs, which in the fiscal year 1895-96 amounted to \$3,870,716, the United States sent \$2,429,295.

American commerce with the French West Indies is considerable, but by no means fully developed. The fact that English is not understood to any great extent in the islands handicaps the American merchant, and the various consuls have urged that American traveling agents speak French. The Danish and the Dutch West Indies are the smallest of the archipelago, and their trade is consequently less important, but here also American commerce seems to be increasing, for during the fiscal year ending June 30, 1896, there was a decrease in European imports, but an increase of over \$40,000 in the American, while of the exports, which were estimated at \$60,000, \$37,987 came to this country. The revenue of the British West Indies for 1896 was £1,890,012 and the expenditure £1,940,005; the imports for the same year were £6,440,463 and the exports £5,252,053. See the separate articles on the islands.

WEST VIRGINIA, a central eastern State of the United States, has an area of 24,780 square miles. Capital, Charleston.

Production and Industries.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 20,328,826 bushels, value, \$7,521,666; wheat, 5,816,700, \$4,129,857; oats, 2,910,668, \$873,200; rye, 157,618, \$81,961; buckwheat, 299,280, \$146,647; potatoes, 2,256,428, \$1,218,471; and hay, 784,140 tons, \$6,586,776—total value, \$20,558,578. Live stock comprised horses, 151,847; mules, 7,412;

milch cows, 163,895; other cattle, 243,460; sheep, 440,014; and swine, 331,563—total head, 1,338,191. With a total output of 14,248,159 short tons, spot value, \$8,987,393, an increase in a year of 1,371,863 tons, West Virginia became the third coal-producing State in 1897. Fayette, 4,001,540 tons; McDowell, 3,235,344; and Marion, 1,739,846, were the largest county producers. All mines numbered 198; employes, 20,504. The coking industry, with 84 plants, using 8,404 ovens, consumed 2,413,283 short tons of coal, and had an output of 1,472,666 short tons of coke; value, \$1,933,808. Petroleum developed large results during the year, and brought the State up to third rank. The output was 13,090,045 barrels, worth \$10,310,178, an increase of over 3,000,000 barrels in a year. Early in the year a remarkable new field, known as the Elk Fork Pool, was opened, and by the end of the year 192 wells were in operation, and the production of ten months was 1,504,290 barrels. In natural gas there was a production approximately worth \$912,528, an increase of over 40 per cent. in a year, from 150 wells. The clay industry yielded \$595,734 in brick and tile and \$519,520 in pottery; quarrying, \$108,834 in limestone and sandstone; and salt, 441,893 barrels, worth \$160,129, an increase of 264,972 barrels. The various taxable manufactures of the State yielded the Federal Government \$816,305 in revenue in the year ending June 30, 1898.

Railroads.—On January 1, 1898, the total length of steam railroads was reported at 2,161.19 miles, of which 68.25 miles were constructed during the previous year. The street railroads had a total length of 52.25 miles. All railroad property had an assessed valuation of \$22,028,362 for 1897.

Banks.—On October 31, 1898, there were 33 national banks in operation and 8 in liquidation. The active capital aggregated \$3,351,000; circulation, \$1,469,562; deposits, \$8,911,351; reserve, \$2,525,477. State banks, June 30, 1898, numbered 41, and had, capital, \$1,783,685; deposits, \$6,852,247; resources, \$9,601,130. There was one mutual savings bank, with deposits, \$296,974; resources, \$302,674.

Education.—In the school year 1895-96, the last for which details were available at the time of writing, the percentages of public school enrollment by races were: White, 65.54; colored, 61.78. For higher education there were 25 public high schools, 15 private secondary schools, 7 public and 3 private normal schools, 3 colleges and universities, co-educational and for men only, with 44 professors and instructors, 592 students, and \$71,412 income; a college for women, with 4 instructors, 30 students, and \$3,000 income; and a law school. The Federal Government appropriated \$22,000 in 1897 and \$23,000 in 1898 to promote agriculture and the mechanic arts in the State. The higher institutions had a total of 41,337 volumes in their libraries. On July 1, 1898, the permanent school fund amounted to \$924,659. Periodicals in 1898 numbered 175; dailies, 15; weeklies, 143; monthlies, 13.

Finances.—The assessed valuations for 1897 were: Real estate, \$149,425,049; personal property, \$48,060,785; and railroad property, \$22,028,362—total, \$219,454,196. Tax rate for 1898, \$2.50 per \$1,000. The State has no recognized debt. For dispute over debt question see corresponding paragraph under VIRGINIA.

Population.—As estimated by federal officials, the population on June 30, 1898, was about 910,000. Local estimates gave Huntington, 15,000; Parkersburg, 15,000; Charleston, 10,000; Bluefield, 8,000; Moundsville, 5,000; Sistersville, 5,000.

National Representatives and State Officers.—West Virginia's representatives to Congress are: B. B. Dovener (Rep.), from Wheeling; A. G. Dayton (Rep.), from Philippi; Daniel E. Johnson (Dem.), from Bluefield, and R. H. Freer (Rep.), from Harrisville. Senator, Stephen B. Elkins (Rep.), from Elkins, and another Republican. The State officers are: George W. Atkinson, Governor; W. M. O. Dawson, Secretary; M. H. Kendall, Treasurer; L. M. Lafollette, Auditor; E. P. Rucker, Attorney-General; J. R. Trotter, Superintendent of Schools, and J. W. M. Appleton, Adjutant-General. All are Republicans. Chief Justice, Henry Brannon (Dem.); Associates: Marmaduke H. Dent (Dem.), John W. English (Dem.), and H. C. McWhorter (Rep.); Clerk, J. A. Holly (Dem.). There are 51 Republicans and 46 Democrats in the State legislature.

WESTERN AUSTRALIA, a British colony in the western part of the continent of Australia, with an area of 975,920 square miles and a population estimated in 1898 at 170,021. The capital is Perth, with an estimated population of 43,000. It has a fine climate, and in parts of the country the land is very fertile. The mineral wealth is considerable, including magnetic iron ore, lead, copper and zinc ores and gold. Other products are wool, pearl shells, pearls, sandalwood, timber, skins, etc., which with gold constitute the chief exports. It is administered by a governor appointed by the Crown and a parliament consisting of a legislative council and legislative assembly containing respectively 24 and 44 members chosen by the people. In 1898 the governor was Sir Gerard Smith, and the premier and treasurer Sir John Forrest.

WEYMAN, STANLEY, novelist, was born in Ludlow, August 7, 1855. He was educated at Oxford, and from 1881 till 1890 practised law. His *House of the Wolf*

(1889), a romance of French history, brought him fame, and was succeeded by *The New Rector* (1890), *The Story of Francis Chuddes* (1891), *A Gentleman of France* (1893), *Under the Red Robe* (1894), *My Lady Rotha* (1894), *The Red Cockade*, (1896), *The Man in Black* (1897), and *Shrewsbury* (1898).

WHEAT. One of the most sensational events in the history of the wheat market during the year was the attempt of Joseph Leiter, of Chicago, to corner the market. His deal in wheat was made in December, and by it he is said to have secured control of nine million bushels, having been backed in his venture by his father, Levi Z. Leiter, the Chicago millionaire. Young Leiter was reputed to have expressed confidence that the price of wheat would rise and that all he and those who had been associated with him would have to do was to wait until the time came for sale. Philip D. Armour, who had been operating as a "bear," was short to the extent of four million bushels, it is said, but managed to get the wheat into Chicago and actually deliver it in spite of the closing in of the winter, which made transportation difficult. He hired a fleet of vessels to bring down the wheat from Duluth and Fort William and kept another fleet of tugs to clear the way for these vessels by cutting the ice. At the same time many train loads of his wheat were hurried in from Minneapolis and other places. Early in 1898 Leiter made extensive purchases of May and July wheat, and by March 1 was said to have control of twenty million bushels. On May 10 cash wheat reached the highest point that it had attained in twenty-one years, viz., \$1.91. It was reported on May 10 that Leiter's profits would amount to at least \$4,500,000. Two months before this he is said to have boasted that he owned all the contract wheat in the country with the exception of some small contract in the hands of the farmers. Further speculation is said to have caused his failure. He bought options contrary to the advice of his father, and the latter notified the banks on June 13 that he would no longer be responsible for his son's debts. Young Leiter thereupon began to place enormous blocks of his wheat upon the market. His July wheat sold at 75 cents and his September wheat at 69¼ cents. Soon afterwards Mr. Armour purchased seven million bushels of Leiter's cash wheat and assumed control of the latter's entire holdings. The net loss to the promoter has been estimated at from \$3,000,000 to \$5,000,000.

The following table, published by the United States Department of Agriculture, shows the acreage, production and value of wheat in the United States in 1898:

States and Territories.	Area. Acres.	Production. Bushels.	Value.
Maine	1,808	35,256	\$31,378
New Hampshire	516	9,804	9,020
Vermont	3,870	87,075	78,368
Massachusetts .....	.....	.....	.....
Rhode Island .....	.....	.....	.....
Connecticut	300	6,000	5,280
New York	379,069	8,036,263	5,786,109
New Jersey	124,616	2,168,318	1,582,872
Pennsylvania	1,520,568	26,609,940	18,094,759
Delaware	74,343	988,762	682,246
Maryland	767,316	11,739,935	8,217,954
Virginia	753,625	10,626,112	7,013,234
North Carolina	573,331	5,274,645	4,114,223
South Carolina	111,482	1,181,709	1,110,806
Georgia	260,736	2,607,360	2,555,213
Florida .....	.....	.....	.....
Alabama	43,309	519,708	467,737
Mississippi	2,165	30,094	24,978
Louisiana .....	.....	.....	.....
Texas	631,653	9,348,464	6,356,956
Arkansas	212,276	2,335,036	1,354,321
Tennessee	1,059,097	13,980,080	9,366,654
West Virginia	421,500	5,816,700	4,129,857
Kentucky	939,314	14,465,436	8,968,570
Ohio	2,491,312	42,103,173	27,788,094
Michigan	1,637,589	34,061,851	21,799,585
Indiana	2,463,207	38,426,029	24,208,398
Illinois	1,757,668	19,334,348	11,600,609
Wisconsin	760,554	13,689,972	8,077,083
Minnesota	4,963,159	78,417,912	42,345,672
Iowa	1,328,720	22,189,624	11,538,604
Missouri	1,439,230	14,104,454	8,321,628
Kansas	4,573,198	64,939,412	32,469,706

Nebraska	2,114,592	34,679,309	16,299,275
South Dakota	3,390,397	42,040,923	21,020,462
North Dakota	3,864,892	55,654,445	28,383,767
Montana	71,188	2,100,046	1,218,027
Wyoming	22,136	524,623	361,990
Colorado	255,877	6,729,565	3,768,556
New Mexico	192,728	4,586,926	2,843,894
Arizona	24,307	770,532	708,889
Utah	182,328	5,105,184	2,756,799
Nevada	36,699	1,064,271	1,011,057
Idaho	135,384	4,196,904	2,140,421
Washington	969,134	23,453,043	12,664,643
Oregon	1,205,281	24,708,260	15,319,121
California	1,343,341	12,224,403	8,801,570
Oklahoma	951,463	14,176,799	7,371,935
Indian Territory .....	.....	.....	.....
Total	44,055,278	675,148,705	\$392,770,320

WHEELER, JOSEPH, major-general of volunteers, was born in Augusta, Ga., September 10, 1836. Upon his graduation from the Military Academy at West Point in 1859 he was assigned to the Fifth Dragoons, with rank of second lieutenant, and served in New Mexico. On April 22, 1861, he resigned his commission and was made colonel of the Nineteenth Alabama Infantry. After the battle of Shiloh, in which he commanded a brigade and did good work, he was transferred to the cavalry and had command of this part of Bragg's army during the Kentucky campaign. In 1862 he was commissioned a brigadier-general, and a year later major-general. General Wheeler's movements were remarkable for their brilliancy and success. He raided Western Tennessee, fought at Grand River and Perryville, and commanded the cavalry at Murfreesboro. His command was conspicuous at Chickamauga, and after the battle did great damage to Rosecrans' supply trains. It is said that the damage effected by Wheeler at this time amounted to \$3,000,000. His charges at Knoxville, Missionary Ridge and Lookout Mountain were largely effective in making possible orderly retreats on the part of the Confederates. Probably his most famous work was his continued attacks on Sherman's army in its advance to Atlanta. He commanded the cavalry corps of the western Confederate army until the close of the war; at this time he was senior cavalry officer in the Confederate army, though only twenty-nine years of age. Up to 1880 he was a lawyer and cotton planter, but in that year was elected to Congress from the Eighth Alabama District. The election, however, was contested, and he did not secure his seat, but was re-elected in 1884 and at every succeeding election, including that of 1898. By holding office in the army he lost his seat in the last session of the Fifty-fifth Congress, but was in attendance, exercising the privileges of an ex-member. He has an excellent record as representative and is held in great popular esteem throughout the country. In the Santiago campaign he commanded the dismounted regular cavalry in General Kent's division. See SPANISH-AMERICAN WAR.

WHIST LEAGUE, AMERICAN, an organization of whist clubs formed in Milwaukee in 1891. Each year a congress is held for a week, when players from all parts of the world participate in a tournament. These have been: Milwaukee, 1891; New York, 1892; Chicago, 1893; Philadelphia, 1894; Minneapolis, 1895; Brooklyn, 1896; Put-in-Bay, 1897; and Boston, 1898. At the last congress the following officers were elected for 1899: E. Leroy Smith, president; Benjamin L. Richards, vice-president; L. G. Parker, corresponding secretary; Clarence A. Henriques, of Boston, recording secretary; and John T. Mitchell, treasurer. The American Whist Club, of Boston, won the Hamilton trophy—the whist championship of the United States—and also the American Whist League trophy. The Newton Club, of Newton, Massachusetts, won the Minneapolis Cup; and the New York State Whist Association won the Brooklyn trophy for auxiliary associations. The next congress will meet in Chicago.

WHITE CROSS SOCIETY was founded by the Bishop of Durham, at Bishop-Auckland, England, in February, 1883, and begun in America by the Rev. B. F. De Costa, of New York, in the winter of 1883-84. Its object is to raise the standard of social purity. President, Rev. B. F. DeCosta, D.D., 224 Waverley Place, New York. and Secretary, Willoughby R. Smith. The Central White Cross Committee, representing the whole Protestant Episcopal Church, consists of the Bishops of Chicago, New York, Minnesota, Central New York and Pittsburg; Rev. Drs. Morgan Dix, J. H. Eccleston and D. Parker Morgan, and E. P. Dutton. General Secretary, Rev. B. F. De Costa. The annual meeting occurs in February.

WHITE, EDWARD DOUGLASS, Associate Justice of the Supreme Court of the United States, was born November, 1845, in the parish of Lafourche, La. After

a preparatory education at Mount St. Mary's, near Emmettsburg, Md., and at the Jesuit College in New Orleans, he became a student at Georgetown (D. C.) College. He served in the Confederate army; after the war studied law, and in December, 1868, was licensed to practise by the Supreme Court of Louisiana. Mr. White entered the Federal Senate, as a Democrat, from Louisiana, succeeding James B. Eustis, and took his seat March 4, 1891. Before the expiration of his term he was appointed to the supreme bench by President Cleveland, February 19, 1894, and assumed office on the 12th of the following month.

WHITE, GLEESON, English writer on art, died November 14, 1898. He was born at Christ Church, Hampshire, March 8, 1851; was educated at Christ Church School, and became a member of the Art Workers' Guild. The attention of the public was called to him by his first book, *Ballades and Rondeaux*, which appeared in the "Canterbury Poets" series in 1887. He edited *Garde Joyeuse* (1890), a collection of poems by American authors, and *Book-song*, which appeared (1893) in the "Booklover's Library." Mr. White came in 1890 to New York, where he acted as associate editor of the *Art Amateur* (1891-92). Returning to England in 1893, he founded the *Studio*, which he edited for about a year, and to which he contributed up to the time of his death. He was also a contributor to the *Magazine of Art* and various other periodicals. Besides being a good authority on modern art, he was a designer of much versatility and good taste. Mr. White wrote *Practical Designing*, 1893; *Salisbury Cathedral*, 1896; *English Illustrations in the Sixties*, 1897; *Master-painters of Great Britain*, four volumes, 1897-98. He will also be remembered as editor of the "Ex Libris" series, the "Connoisseur" series and the "Pageant."

WHOOPING-COUGH. See PUBLIC HEALTH.

WIKOFF, CHARLES A., colonel of the Twenty-second Infantry, U. S. A., was killed in the storming of San Juan Hill, July 1, 1898. He was born in Pennsylvania, March 8, 1837; in 1861 he enlisted as a private in the Union service and rose to the rank of captain, and for gallantry and meritorious services at Shiloh, Chickamauga and Missionary Ridge was brevetted major. After the war he entered the regular army; after transfers to the Twenty-fourth and Eleventh infantry regiments, he became in 1866 major in the Fourteenth; was promoted November 1, 1891, lieutenant-colonel of the Nineteenth, and January, 1897, colonel of the Twenty-second. He was acting as a brigadier-general when killed before Santiago. Camp Wikoff at Montauk Point, Long Island, was named after him. See SPANISH-AMERICAN WAR (paragraph Fight at San Juan).

WILHELMINA HELENE PAULINE MARIE, Queen of the Netherlands, on August 31, 1898, was eighteen years old, at which age, according to the law of Holland, a sovereign "comes of age." Her mother, Queen Emma, formally retired from her position as Queen Regent on the day previous, and on her birthday the young Queen issued a proclamation expressing her gratitude for the love of her people and her readiness to assume the responsibilities of actual sovereignty. "It shall be the aim of my life," she said, "to follow her [Queen Emma's] example and govern in a manner expected of a Princess of the House of Orange. True to the constitution, I desire to strengthen the respect for the name and flag of the Netherlands. . . . Trusting in God and with the prayer that He will give me strength, I accept the Government." The enthronement (Holland does not have a *coronation*) took place in the Nieuwe Kerk, which, notwithstanding its name, is more than four hundred years old, in Amsterdam on September 6. This day in Amsterdam, as well as those immediately succeeding both in this city and in other towns of the kingdom, was one of great festivity and popular rejoicing. In the morning the Damplatz in front of the Palace was crowded with people anxious to see the regal procession pass to the church. After personages of royal blood and high rank, the princes from Holland's East Indian colonies, diplomatists and others who were favored with a place had taken their seats in the church, the Queen-Mother, attended, entered, and in about ten minutes was followed by Wilhelmina, who, robed in white with a mantle of red velvet on which the Lions of Nassau were embroidered in gold, and attended by a gorgeous procession, headed by the King of Arms, came walking with great stateliness and composure. Before her the sword of state was carried by a general. The processions were greeted with loud and prolonged cheering, the people giving Wilhelmina every indication of their sympathy and love, the shout of "Leve de Konigin!" being most prominent. Having entered the church, she took her seat on the throne and then presently rose and addressed the States General with words which, remarkable in themselves, are still more interesting from the fact that, according to very good authority, they were her own composition. This speech which attracted so much attention follows in full:

"Gentlemen of the States General: Since the death of my ever-lamented father, and until I have completed my eighteenth year, the government has been in the hands of my mother. I have now assumed the government and I have issued a

proclamation to my well-beloved people. The hour has now arrived when, amid the faithful States General, and invoking the holy name of God, I shall pledge myself to the people of the Netherlands to maintain their rights and privileges. On this day I draw more closely the solemn tie existing between myself and my people. The very ancient union of the Netherlands and the House of Orange is confirmed afresh.

"Beautiful is my vocation. Beautiful is my task. I am happy and grateful to be able to govern the Netherlands people, a nation small in number, but great in courage, great in nature and in character. I esteem it a privilege and a pleasant duty to devote all my strength to the prosperity and welfare of our Fatherland. The words of my ever-to-be-remembered father I make wholly my own: 'The House of Orange can never, no never, do enough for the Netherlands.' I need your support and co-operation, and I am convinced that you will lend me these, in order that we may be able to work together for the honor and prosperity of our Netherlands people. May this be the aim of our life, and may God bless your labors and mine for the salvation of the Fatherland."

The speech was well delivered and effective. The Queen then took the oath to "uphold the constitution, defend the independence of the country, protect the liberty of the subjects, using therefor all legal means, 'as a good King should,'" and the members of the States General took the oath of loyalty to the Queen.

A festival lasting two days in Amsterdam followed the enthronement, and consisted chiefly of processions, pageants, illuminations, a great water carnival and display of fireworks. On Friday, September 9, the Queen arrived at The Hague, which was beautifully decorated in her honor; after being received at the palace, she went with her mother to the principal church of the city, where a solemn service was held. The principal demonstrations of the following day were a serenade to the Queen at the Palace by several thousand children, a parade of troops, and in the evening a state performance in the Royal Zoölogical Gardens, a chief feature of which was a cantata composed for the occasion by Mr. Viotta, the director of the Royal Academy of Music. On September 11 the Queen began a progress of several days through many towns and villages of Holland; the popular rejoicing and expressions of good will to the Queen took the form of processions, bands of music, the drama, and crowds of children singing patriotic airs. It was said that on the 12th, near the forest at Ryswyk, there was a concourse of about 12,000 children. During the week Wilhelmina, appearing on horseback, reviewed the army at Renkum and the navy at Hollandsch Diep. After several court festivals she opened the States General (September 20) in person, and, having expressed her gratitude for the love of her people, she spoke briefly, but with considerable ability, on various political and social questions, and emphasized her feeling of sympathy with the recent peace proposal of the Czar.

Wilhelmina is the daughter of the late William III. and his second wife, Emma, daughter of Prince George Victor of Waldeck. Up to 1888 the Salic law, precluding female succession to the throne, was in force, but as it was not included in the constitution, the King, upon the death of his second son at this time, annulled it with the consent of the Senators and Deputies and insured the right of succession to his daughter. Both of his sons were by his first wife, and the elder had died some years before after a career of dissipation in Paris. Upon the death of King William, November 23, 1890, Wilhelmina succeeded to the throne under the regency of her mother, by whose guidance she has received a sound and thorough education. Though she is fond of sports and outdoor life in general, she has shown herself to be a student of no mean ability, having a fair knowledge of music and painting, being well grounded in history, and speaking, besides her own tongue, French, German and English. Before her enthronement she made a statement, which was widely read with great interest, to the effect that she would never marry for state reasons alone. In October, 1898, it was announced that from among many suitors she had selected as her future husband her cousin, Prince William of Wied, an officer in the German army. Wilhelmina is sweet-tempered, self-reliant and progressive, and the indications are that she will verify the words of her mother: "I intend to make her something better than a strong woman; I intend to make her a king."

WILLARD, FRANCES ELIZABETH, President of the National and of the World's Woman's Christian Temperance Union, died in New York city, February 18, 1898. Having for years labored ceaselessly and endured many cares and troubles, she finally succumbed to an attack of influenza. It was thought that the strain brought upon her by the great conventions at Toronto and Buffalo shortly before her death had left her in such a condition that she was unable to withstand an attack of disease. Frances Willard was born of New England ancestry, near Rochester, N. Y., on September 29, 1839; when she was still a girl her family moved to Wisconsin and thence in 1858 to Evanston, Ill. Upon graduating from the Northwestern University at Evanston, she taught in several Western towns and finally in her own



QUEEN WILHELMINA.

university. In 1868 and 1870 Miss Willard travelled in Europe and the East, studied in Paris and wrote for American journals. From 1871 to 1874 she was president of the Woman's College in Evanston, and it was here that her fine ability in leadership was first shown. She gave up her college work in 1874 and began to give temperance lectures; four years later she was made corresponding secretary of the Woman's Christian Temperance Union; in 1879 she became president of the National Union and in 1888 of the World's Union.

Miss Willard was one of the most effective female speakers in America. For years her energy seemed to be almost boundless. She was usually accompanied on her tours by her friend, Miss Anna Gordon. Miss Willard is said for ten consecutive years to have addressed on an average one public meeting a day, and to have spoken in every town or city of ten thousand or more inhabitants in the United States. She did a vast amount of work in transit from place to place, thinking, planning, writing articles and addresses. Since 1892 she had been editor-in-chief of the *Union Signal*, the official organ of the Woman's Christian Temperance Union. Among her longer literary works may be mentioned *Nineteen Beautiful Years*, the subject of which is her younger sister, who died at nineteen; *Woman and Temperance*, and *Glimpses of Fifty Years*, which is autobiographical, but which also outlines the rise and course of the temperance movement.

Miss Willard was not only a good scholar, but was a woman of great executive ability, cleverness and tact. So kindly and noble was her nature that, while having the respect of all, she even gained the love and admiration of those who politically and theoretically did not agree with her. The main object for which she gave her life-work and for which she strove to perfect the "Union," that before she died had been extended into fifty countries, was twofold, including, first, state prohibition of the manufacture, transportation and sale of alcoholic beverages, and, second, the extension of the suffrage to women. However from a political point of view Miss Willard may have failed, from a social point of view it may be said without great fear of exaggeration that she accomplished more for the cause of temperance and for the emancipation of woman from conventional ideals than any other person of her time. She was spoken of as "the best-loved woman in the United States," and at her death a well-known journal editorially said: "It is doubtful whether the death of any woman, save possibly Victoria, Queen of England, could have produced so widespread and so profound sorrow as will be produced by the death of Miss Frances Willard."

WILLIAMS, GENERAL JOHN S., formerly United States Senator from Kentucky, died near Mount Sterling, Montgomery county, Ky., July 17, 1898. He was born at Mount Sterling in 1820; was graduated at Miami University, Oxford, O., 1839; practised law at Paris, Ky. He served in the Mexican War, distinguishing himself at Cerro Gordo. He was opposed to secession, but on the outbreak of the Civil War joined the Confederates, and rose to the rank of brigadier-general, 1862. He was a member of the Kentucky legislature as a Whig, 1851-52, also in 1857 and 1875; and Democratic United States Senator, 1878-85.

WILLIAMS, GENERAL NELSON GROSVENOR, died in Brooklyn, N. Y., December 1, 1897. He was born at Bainbridge, N. Y., May 4, 1823; was graduated at West Point in 1843, being a classmate of General U. S. Grant. During the first year of the Civil War he did gallant service in Missouri, where he remained until March, 1862; on April 6 of this year he commanded a brigade in the Army of the Tennessee at the battle of Shiloh and was temporarily paralyzed from shock, caused by a cannon-ball killing his horse. In 1869 he was made brigadier-general, but not long after resigned on account of the injuries received at Shiloh.

WILLIAMS COLLEGE, at Williamstown, Mass., was established in 1793, and is non-sectarian and for men only. The regular course leads to the degree of Bachelor of Arts, and offers but does not require the study of Greek. In the freshman year any one of five groups of courses is offered, the courses in each group being required. In the sophomore year, ten hours of recitation work a week are prescribed and six hours elective; in the junior year six hours are prescribed and nine elective; in the senior year the work is almost entirely elective. For the year 1898-99 the officers of instruction numbered 32; the student enrollment was: Graduate students, 20; seniors, 86; juniors, 86; sophomores, 82; freshmen, 87; in the partial course, 24; total, 385. The library, for the maintenance and enlargement of which about \$4,000 is annually expended, comprised 42,850 bound volumes and over 16,000 pamphlets. The following degrees were conferred in 1898: B.A., 58; M.A., 7; and the honorary degrees, M.A., 2; D.D., 3; LL.D., 2. The college suffered the loss of Professor James Ingraham Peck, Ph.D., assistant professor of biology, who died in November, 1898. The president since 1881 has been Franklin Carter, LL.D. See UNIVERSITIES AND COLLEGES.

WILMINGTON, N. C., a city of about 25,000 inhabitants, is situated in the heart of a fertile district on the Cape Fear River, which gives it easy communication with the sea. It was the object of public attention throughout the United States in the year 1898 on account of the trouble with the negroes. For the general aspect of the race troubles in the South see the article **NEGRO PROBLEM**, and for an account of the race war in North Carolina in the autumn of 1898 and of the relation of the Wilmington riots thereto see the article **NORTH CAROLINA**. Wilmington, lying in the "black belt" where the negro element is the most numerous, was the seat of the sharpest race antagonism. By a law which passed the legislature after the Populist and Republican victory in 1896, the Republican governor was authorized to appoint five of the ten members of the board of aldermen, the remaining five to be elected from the five wards of the city, of which two were under the control of the negroes. Out of the 25,000 inhabitants of Wilmington, three-fifths, it is said, are negroes. The effect of the law was to deprive the white citizens of their suffrage. Soon there were 36 negro magistrates, a large number of negro policemen, and negroes in some of the important, as well as in a great many of the subordinate offices. Yet of the city taxes it is said that the whites paid 96 2-3 per cent. and the negroes only 3 1-3 per cent., the latter having retained the shiftlessness and improvidence characteristic of their slave days. The whites complained, whether truly or not, that the administration of justice was farcical, that crimes had increased under the inefficient police administration of the negroes, that the ignorant deputy sheriffs, who could not sign their names, were hoodwinked on all sides by criminal offenders, and that burglaries were committed with increasing frequency in the houses of white residents who left the city in the summer time. The anger of the whites was aggravated by an editorial article which appeared in the *Wilmington Record*, a paper edited by a mulatto named Manly (see **NORTH CAROLINA**), in which insulting references were made to the white women of the South. How far the whites were justified in interpreting this article as they did and how far they used it merely for campaign purposes cannot be decided, but quotations from it were made the text of violent harangues throughout the State, and stirred up race hatred to its highest pitch. The movement seems to have had no connection with politics, having taken its start in the action of the Chamber of Commerce, a non-partisan organization which declared it to be the duty of citizens to make every effort for the restoration of order and the protection of property. The only line between parties was the color line. It was a movement for white supremacy, and its authors, among whom were some of the leading and most substantial citizens of the city, were determined to overthrow negro rule at any cost. There was no secrecy in their action and no attempts to disguise their purpose to resort to force if necessary. Previous to the election the city was virtually in a state of siege. Winchester rifles were purchased in large numbers, a rapid-firing gun was secured for the armory, and almost all the whites armed themselves. The wards of the city were regularly officered by citizens who reported to those in command the number of men in each block willing to bear arms and the number of weapons available. In spite of this military preparation there was no outbreak before the election or on election-day itself, but on the day following, it having become known that the whites had won at the polls in Wilmington, as well as in every other part of the State, there assembled a mass meeting of about 1,000 citizens, including physicians, clergymen, merchants and laboring men, representing every class of society. The chairman chosen was Colonel Alfred Moore Waddell. It was decided that the editor of the *Record* should immediately leave the town and that his newspaper plant should be sent away. A "Committee of Twenty-five" was appointed to carry out the resolutions, and thirty-two of the leading negroes were summoned before it. The resolutions were then read and the negroes were required to answer on the following morning. Their answer was delayed by a mistake, and the whites, to the number of about 500, started for the printing office of the newspaper. They demolished the plant, and in so doing set fire to the building. They had not intended to burn the property, and they aided in extinguishing the flames, which had spread to adjoining buildings. The next scene of violence occurred a short time afterward, when a shooting affray took place on the streets, started, it is said, by the negroes, and resulting in the killing of three negroes and the wounding of others. Firing was renewed here and there at intervals during the day, and resulted in several more fatalities. At last the local militia assumed control and additional troops were called in from neighboring towns. The mayor, the chief of police and the board of aldermen resigned and new officers were installed in their places, the new mayor being Colonel Waddell. In the meanwhile thousands of negroes had left the city, and even after peace was restored and every promise of security was made to them they showed great reluctance to return, having heard alarming rumors of an intended slaughter of the negroes by the whites. These were the main events in connection with the race riots in Wilmington. There had been no uprising of the negroes and the conduct of the whites was severely con-

demned in many parts of the Union. Yet it was generally admitted that they had great provocation, and it is impossible at present to apportion the blame with justice, the accounts of observers being generally of a very partisan character.

WILSON, HENRY P. C., M.D., specialist in gynæcology, was born in 1827 and died at Baltimore, Maryland, December 27, 1897. He was at one time president of the faculty of the Baltimore Academy of Medicine, and vice-president of the American Gynæcological Society. Dr. Wilson was one of the founders of the Hospital for Women of Maryland. He was a member of the Maryland Academy of Sciences and consulting physician in almost all the hospitals of Baltimore.

WILSON, JAMES, Secretary of Agriculture, the only foreign-born member of the McKinley cabinet, was born in Ayrshire, Scotland, August 16, 1835; came to the United States in 1852, and with his parents settled in Connecticut; he received an academic education; located in Tama county, Ia., in 1855, and in 1861 engaged in farming on his own account, since which time he has given his attention to practical and scientific agriculture. He was a member of the Iowa legislature from 1867-73, and in the last legislature, 1871-73, was speaker of the house. In 1872 he was elected to Congress, and represented the Fifth Iowa district in the Forty-third, Forty-fourth and Forty-eighth Congresses; during the time between the last two Congresses Mr. Wilson was a member of the Railway Commission. While a representative in Washington he was always active in promoting legislation favorable to agricultural interests. He was a regent of the State University from 1870 to 1874, and for the six years previous to his cabinet appointment he acted as director of the agricultural experiment station and professor of agriculture at the Iowa Agricultural College at Ames. In every position held by him he has been recognized as a representative farmer; when in Congress he always served on the Committee on Agriculture, and he was active in raising the Department of Agriculture to executive importance, and was, in fact, the author of the bill to that effect passed by the Forty-third Congress. Mr. Wilson has been very successful in suppressing several contagious diseases among animals; in this work he was assisted by the late W. H. Hatch. On March 5, 1897, he was appointed and confirmed Secretary of Agriculture.

WINCHILSEA, TWELFTH EARL OF, and NOTTINGHAM, SEVENTH EARL OF, MURRAY EDWARD GORDON FINCH-HATTON, J. P., M.A., died September 7, 1898. He was born March 28, 1851; was educated at Eton and at Balliol College, Oxford, and in 1875 became a fellow of Hartford College. He was Conservative member of Parliament for South Lincolnshire, 1884-85, and for Lincolnshire, Spalding division, 1885-87. He founded the National Agricultural Union and its organ, the *Cable*.

WINDMILLS. The use of windmills for raising water for irrigation, stock supply and other purposes is rapidly increasing. According to E. C. Murphy (*Windmills for Irrigation*, No. 8, Irrigation Papers, United States Geological Survey), the pumping power of windmills is much less than is usually claimed for them by their makers. With reciprocating pumps 4 to 10 inches in diameter not more than 0.65 horse-power can be obtained from a 12-foot mill. An automatic device should be provided for increasing the load on the mill, or the work it must do, in accordance with increased velocities. With low velocities, as with the light winds of July and August in Kansas, the loads should be small.

WINDWARD ISLANDS, a British possession to the east of the Caribbean Sea, which has a total area of 510 square miles and a population of about 154,100. The group includes Grenada (area, 133 square miles; population, 60,367), St. Vincent (area, 132 square miles; population 41,054), St. Lucia (area, 233 square miles; population, 46,671), and the Grenadines. Negroes constitute the great part of the population. There is a governor and commander-in-chief (Sir Cornelius Alfred Maloney, K.C.M.G.) and a common court of appeals, but the islands have their separate methods of legislative and administrative procedure. The Grenadines are governed partly by St. Vincent and partly by Grenada. The chief products are sugar, coffee, cocoa, spices, etc.

WINGFIELD, Rt. Rev. JOHN HENRY DUCACHET, D.D., LL.D., missionary Protestant Episcopal bishop of Northern California, died at Benicia, California, July 27, 1898. He was born in Portsmouth, Virginia, 1833; was graduated at St. Timothy's College, Maryland, 1850, and at the College of William and Mary, 1853; was ordained priest in the Protestant Episcopal Church, 1858, and passed some years in church work in New York, Connecticut and Maryland, holding several rectorships in the South until 1874, when he became rector of St. James' Church, San Francisco. He was raised to the bishopric of Northern California in 1874.

WINTER, SIR JAMES SPEARMAN, Premier of Newfoundland, was appointed a member of the Anglo-American Commission (see CANADA), which was created in May, 1898. He was born in 1845; engaged in business, but turned to the law, being admitted to the bar in 1867, and becoming queen's counsel in 1880. He was a

member of the house of assembly, 1874-89 and 1893, being speaker, 1877-78. He was member of council, 1879-89; solicitor-general, 1882-85; attorney-general, 1885-89; he was the Newfoundland agent at the Washington Fisheries Conference, 1887-88, and a member of the French Fisheries Commission, 1890.

WISCONSIN, a northern lake State of the United States, with an area of 56,040 square miles. Capital, Madison.

Mineralogy.—The most valuable economic product in the calendar year 1897 was the output of the quarries, which had a value of \$800,986; limestone yielding \$641,232; granite, \$126,134, and sandstone, \$33,620. Iron ore yielded 554,155 long tons, all of red hematite, value, \$703,770, a decrease of nearly 9 per cent. in a year. Of all mineral springs, 28 reported a sale of 2,860,909 gallons, value, \$444,561. Clay-working industries, with 164 plants, had an output worth \$735,082, of which \$724,282 was in brick and tile. In coking, 120 ovens were in operation, consuming 29,207 short tons of coal, and producing 17,216 short tons of coke, worth \$75,000. The production of metallic paint was 1,627 short tons, value, \$19,043.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 35,327,425 bushels, value, \$9,891,679; wheat, 13,689,972, \$8,077,083; oats, 64,643,225, \$15,514,374; barley, 7,515,599, \$3,006,240; rye, 3,444,596, \$1,481,176; buckwheat, 544,902, \$217,961; potatoes, 15,020,656, \$3,604,957; and hay, 2,257,326 tons, \$12,979,624—total value, \$64,772,594. Live stock comprised, horses, 489,822; mules, 4,754; milch cows, 895,822; other cattle, 589,315; sheep, 722,967; and swine, 929,763—total head, 3,632,443.

Banks.—On October 31, 1898, there were 78 national banks in operation and 46 in liquidation. The active capital aggregated \$9,690,000; circulation, \$3,616,532; deposits, \$49,173,252; reserve, \$15,625,056. The State banks, May 5, 1898, numbered 132, and had capital, \$6,878,425; deposits, \$31,880,441; resources, \$42,117,045; surplus, \$1,216,347; private banks, 114, with capital, \$1,072,969; deposits, \$6,887,536; resources, \$8,736,072; surplus, \$359,574. There was also one mutual savings bank, with deposits, \$277,394; resources, \$296,368. In the fiscal year ending September 30, 1898, the exchanges at the United States Clearing House at Milwaukee aggregated \$268,489,482, an increase of \$92,221,180 in a year.

Finances.—The receipts of the treasury in the biennial term ending September 30, 1897, were \$4,226,571.95, with balance, \$4,581,412.69; disbursements, \$4,430,946.48, leaving balance, \$150,466.21. The assessed valuations for 1897 were: real estate, \$519,990,522; personal property, \$108,513,489—total, \$628,504,011; State tax levy, \$1,995,070. There is no public debt, all outstanding bonds, aggregating \$2,251,000, being held in trust for various State educational funds.

Manufactures.—The various taxable manufactures yielded the Federal Government \$5,370,377 in internal revenue in the year ending June 30, 1898. Tobacco industries had an output of 74,648,130 cigars, 5,881,050 pounds of smoking and 610,610 pounds of fine cut; distilled spirits, mostly whiskey, 1,498,688 gallons; fermented liquors, 2,873,044 barrels.

Commerce.—During the fiscal year ending June 30, 1898, the imports of merchandise at the port of Milwaukee aggregated in value \$675,018; exports, \$4,515, an increase in a year of \$174,104 in imports and \$1,754 in exports; vessels engaged in foreign trade that were entered at the custom house had total tonnage, 15,000; vessels that were cleared, 7,500; all steam and all American.

Railroads.—On January 1, 1898, the total length of steam railroads in the State was 6,315.44 miles, of which 139.22 were constructed during the previous year. The capital stock was \$106,157,479; street railways, mostly electric, had a total length of about 315 miles.

Education.—At the end of the school year 1896-97 the school population was 696,933; enrollment in the public schools, 426,565; average daily attendance, 273,958. There were 6,907 public school-houses, 12,377 teachers, school property valued at \$11,648,000, and expenditures, \$5,075,415, including \$3,451,986 for teachers' salaries. For higher education there were 184 public high schools, 26 private secondary schools, 7 public and 2 private normal schools, 9 colleges and universities, co-educational and for men only, with 217 professors and instructors, 2,560 students and \$528,131 income; a college for women, with 15 instructors, 171 students and \$32,586 income, and 4 theological, 1 law and 2 medical schools. The higher institutions had a total of 378,772 volumes in their libraries. A State school for the feeble-minded at Chippewa Falls was opened in 1897. Periodicals in 1898 numbered 619; dailies, 61; weeklies, 514; monthlies, 40.

Population.—The State census of 1895 gave the State 1,937,915; and Milwaukee, 249,290; La Crosse, 28,769; Oshkosh, 26,947; Superior, 26,168; Racine, 24,889; Sheboygan, 21,130; Eau Claire, 18,637; Green Bay, 18,290; Madison, 15,950; Marinette, 15,286; Appleton, 14,641; Fond du Lac, 13,051; Janesville, 12,971; Ashland, 12,310, and Wausau, 11,013. As estimated by Federal officials the population of the State on June 30, 1898, was about 2,110,000.

History and Politics.—Wisconsin was admitted as a State into the Union May 29, 1848. The semi-centennial of the anniversary was celebrated at Madison, Milwaukee and other towns with carnivals, parades and special ceremonies during the month of June, 1898. At Milwaukee a monument costing \$30,000 was dedicated to the memory of Wisconsin's soldiers of the Civil War. Wisconsin politics were chiefly interesting on account of the fight made by the anti-machine Republicans, led by ex-Congressman La Follette. They did not succeed in defeating the renomination of Governor Scofield, but they carried their other demands in the August convention. The reforms accepted were that the property of corporations should be taxed at the same rate as the farms and homes of individuals; that the issuing of passes to public officials by railroad, telegraph, express, telephone companies, etc., should be prohibited; that the presence of the lobby at the State Capitol during the sessions of the legislature should be brought to an end, and that there should be "such legislation as will secure to every citizen the freest expression of his choice in the selection of candidates." The Democratic State convention was also stormy. Judge H. W. Sayer was nominated for Governor. The Milwaukee delegation wanted a fusion with the Populists on the State ticket, and to nominate as the candidates for Secretary of State and Superintendent of Public Instruction the men whose names should be announced by the People's party in convention. The question of fusion, however, was lost by 296 votes against 361, and the Populists nominated a separate and full State ticket. The Republicans elected Scofield Governor by a plurality of 37,784, and all the ten Representatives in Congress were also Republicans. The legislature went overwhelmingly Republican, the Senate consisting of 31 Republicans and 2 Democrats, and the Assembly 81 Republicans and 19 Democrats—a Republican majority of 91 on joint ballot.

National Representatives and State Officers.—Wisconsin's Representatives are: Henry A. Cooper, from Racine; Herman B. Dahle, from Mount Horeb; J. W. Babcock, from Necedah; Theobald Otjen, from Milwaukee; S. S. Barney, from West Bend; J. H. Davidson, from Oshkosh; John J. Esch, from La Crosse; E. S. Minor, from Sturgeon Bay; Alexander Stewart, from Wausau, and John J. Jenkins, from Chippewa Falls. All are Republicans. Senator, John C. Spooner (Rep.), from Madison, and another Republican. Officials: Edward Scofield, Governor; Jesse Stone, Lieutenant-Governor; W. H. Froehlich, Secretary; J. O. Davidson, Treasurer; E. H. Hicks, Attorney-General; L. D. Harvey, Superintendent of Education; E. Giljohan, Insurance Commissioner, and Graham L. Rice, Railroad Commissioner. All are Republicans. Chief Justice, John B. Cassoday (Rep.); Associates, John B. Winslow (Dem.), C. V. Barden (Rep.), J. E. Dodge (Dem.) and Rouget D. Marshall (Rep.); Clerk, Clarence Kellogg. The State legislature consists of 21 Democrats and 112 Republicans.

WISCONSIN, UNIVERSITY OF, at Madison, was organized in 1849 and reorganized in 1866; it is a State institution, non-sectarian and co-educational. Besides the college of arts and science, the university includes colleges of mechanics and engineering, law, pharmacy, agriculture, the school of music, the department of university extension and the summer school. For the year 1898-99 the officers of instruction in all departments numbered 132; the student enrollment, exclusive of the summer school, was about 1,925. The president is Charles Kendall Adams, LL.D. Of the buildings used by the university at the close of 1898, eight were of stone and five of brick. At this time there was in process of construction on the university grounds a building for the university library and for the library of the Wisconsin Historical Society. It will probably be completed in 1899 at a cost of about \$600,000. It will be a "fire-proof" building, and is of the Ionic order of architecture. At the close of the year there was also an addition being made to University Hall, at a cost of about \$60,000. See UNIVERSITIES AND COLLEGES.

WOMEN'S CLUBS, FEDERATION OF, organized and incorporated in 1892, consists of more than 2,709 women's clubs, with a membership of about 200,000 women in the United States and foreign countries. Its aims are to bring the various women's clubs throughout the world into communication so that they may become mutually helpful. There are 30 State federations and 595 single clubs belonging to the general federation. President, Mrs. Rebecca D. Lowe, Atlanta, Georgia. The last biennial meeting was held in June, 1898, in Denver.

WOMEN'S NATIONAL DEMOCRATIC LEAGUE, founded in 1896, to promote the cause of true Democracy in accordance with the Federal Constitution and the platform of 1896. President, Mrs. Mary A. Mullens; Secretary, Ella V. Cameron, 753 Third Avenue, New York.

WOMEN'S RELIEF CORPS, AUXILIARY TO THE GRAND ARMY OF THE REPUBLIC, was organized by the female relatives of Union soldiers of 1861-65 to aid the G. A. R. whenever needed, "to perpetuate the memory of their heroic dead," to assist widows and orphans, to cherish the deeds of army nurses, and to inculcate.

patriotism among the children and the community at large. There are many departments, subdivided into corps. The membership in 1896 was 138,444. National President, Agnes Hitt, Indianapolis; National Secretary, Ida S. McBride, Indianapolis, Ind.

WOOD, LEONARD, M.D., brigadier-general, United States volunteers, was born at Winchester, N. H., in 1860. He was graduated from the Harvard Medical School in 1884, and, after practising medicine in Boston, entered the army, being appointed in 1886 assistant surgeon, with the rank of captain, in the Eighth Infantry. In the trouble with the Indian chief Geronimo, Captain Wood commanded a detachment and rendered services for which, in 1888, he received an honor medal. After serving in California and Georgia he removed to Washington. In his frontier service he had shown unusual skill and efficiency, as well as personal bravery. When hostilities with Spain arose, it was Dr. Wood's idea to recruit the First Volunteer Cavalry ("Roosevelt's Rough Riders") largely from the Far West and Southwest, and he was appointed its colonel, with Mr. Roosevelt lieutenant-colonel. On July 8, 1898, President McKinley appointed Colonel Wood brigadier-general, and upon the capture of Santiago he was made its military governor, in which position he has rendered most efficient service. See SPANISH-AMERICAN WAR (paragraph Santiago Campaign); also CUBA.

WOODMEN OF AMERICA, FRATERNITY OF MODERN, a society founded in 1883, has 1 head camp, 5,732 local camps and 324,988 members; \$11,070,635 has been disbursed since its organization and \$1,731,900 during its last fiscal year. Head Consul, W. A. Northcott, Greenville, Ill.; Head Clerk, C. W. Hawes, Rock Island, Ill.

WOODMEN OF THE WORLD, a fraternal society founded in 1890, has 3 head camps, 3,000 local camps and 127,000 members. Since its organization it has disbursed \$3,722,918 and \$1,182,344 during its last fiscal year. Sovereign Commander, Joseph Cullen Root, Omaha; Clerk, John T. Yates, Omaha.

WOODRUFF, WILFORD, the fourth president of the Mormons, or as the sect is officially known, the Church of Jesus Christ of Latter-Day Saints, died in San Francisco on September 1, 1898. Born in Avon, Conn., March 1, 1807, he was educated at the Farmington Academy, and in early life became identified with the Mormon Church. At twenty-six he was ordained to the priesthood, and from that time experienced the various fortunes and misfortunes of the Church as it proceeded westward. On the 29th of April, 1839, he was ordained one of the twelve apostles of the church, and was recognized at this time as a successful and eloquent preacher. He accompanied Brigham Young in 1849 to what was then the desert of Utah, and from that time was one of the most able and active supporters of the church. He was a man of great enthusiasm, and firmly believed in the tenets of his sect; not even his opponents questioned his honesty, and his simplicity, kindliness and lack of arrogance endeared him to his people. Mr. Woodruff succeeded to the presidency of the church upon the death of President John Taylor in 1877; his administration was marked by carefulness and order in all church affairs. Although he was a firm defender of the system of polygamy, the most important event in his administration was the manifesto issued by him on April 6, 1890, in which he as the "voice of God" abolished, or as some of the Mormons seem to think, suspended the principle and practice of polygamy. His death aroused no little discussion of the Mormon Church and brought to light the attitude of various authorities on Mormonism. Among these discussions appeared the report adopted by the State Presbytery of Utah in its session on August 29, 1898, in which it brought against the Mormon Church seven formal charges, which, briefly summed up, were as follows: The Mormon Church has reassumed its political position and subordinates the choice of the voter to the wish of the priest; the church has determined to control State schools without just consideration for the non-Mormon population; it was further charged that the priesthood was secretly encouraging the people to "live their religion," that is, to practise the "celestial order of marriage," or polygamy. The Presbytery affirmed that at least 2,000 polygamous marriages had occurred since Utah became a State on January 4, 1896. The fourth charge related to the undue use of church influence by means of which violations of the law were winked at, the courts refusing to enforce the statutes; it was also urged that the same church influence prevented the laboring and business classes from revealing the real state of affairs in Utah. The sixth accusation brought by the Presbytery was that the Mormons were attempting to spread their creeds through missionary mendicants, and lastly that the methods used by their exhorters were not fair, in that their creeds were presented at first with much innuendo and deceit. Mr. C. W. Penrose, writing in the Mormon organ, *The Deseret News*, made a seriatim reply to these charges, which amounted almost to a wholesale denial of them. In regard to the prevalence of polygamy existing contrary to the State constitution and to the manifesto, or "revelation," of President Woodruff

Mr. Penrose said that since 1890 not a polygamous marriage had occurred in Utah; he added, however, that on the grounds of humanity and social necessity husbands who had married more than one wife previous to 1890 still lived with them, supporting them and their families. The discussions of Mormonism referred to the ignorance on which the church is founded as well as the firm hold which the creeds have upon the Saints. Information gathered from Mormon sources leads one to believe that the church expects to return to the system of polygamous marriage as soon as the law can be successfully connived at or changed. At present there occur "celestial marriages," in which the contracting parties are united simply for the future life and are free to marry otherwise in this life. It is said that the masses of the Mormon Church are very ignorant and resemble, to some extent, the "poor whites" of the Southern States; over such people, the priesthood, assisted by a formal and mysterious ritual, wield immense influence. A rumor was rife in 1898 that the Mormons contemplated leaving Utah, but this was emphatically denied by *The Deseret News*. It added, however, that the Saints believe that the city Zion is to be built in Jackson County, Mo., but that they intend to build the city and "possess the land" in no unusual or illegitimate way. The *News*, as well as the Mormon leaders, seems to encourage no outward infringement of the laws, but urges the Saints to practise principles of equity and fairness not only to themselves, but to their Gentile neighbors. President Woodruff was succeeded by Lorenzo Snow (q. v.).

WOOL AND THE WOOLEN INDUSTRY. During the year ending with December 31, 1898, there were sold at Boston, Philadelphia and New York 231,000,000 lbs. of wool, or only 44 per cent. of the sales for 1897, which amounted to 527,055,574 lbs. The total sales of United States wool for the last four calendar years follows:

1895.....	379,875,908 lbs.	1897.....	527,055,574 lbs.
1896.....	344,211,300 "	1898.....	230,496,835 "

There were, according to the Department of Agriculture, 37,659,960 sheep in the United States on January 1, 1898, an increase of 800,000 over the year previous. The total number of sheep and their value for the last five years is given as follows:

1894.....	43,048,017	\$89,186,110
1895.....	43,394,064	66,885,769
1896.....	38,298,788	65,167,735
1897.....	35,818,642	67,020,942
1898.....	37,659,960	98,734,133

According to the government report for the year ending December 31, 1897, the actual spring clip was 207,897,101 lbs., to which the *American Wool and Cotton Reporter* adds 40,000,000 lbs. for pulled wool, making a government total of 247,897,101 lbs. The same authority estimates the actual fleece weight production for 1898, including an allowance of 36,860,619 lbs. for pulled wool, at 266,720,684 lbs., or 111,661,581 lbs. of scoured wool.

The amount of wool clipped in the United States since about 1873 amounts to 6,381,336,443 lbs., while the yearly wool clip, from 1894 to 1897 inclusive, has been:

1894.....	398,057,394 lbs.	1896.....	372,474,708 lbs.
1895.....	309,748,000 "	1897.....	259,168,351 "

According to the *American Wool and Cotton Reporter*, the imports, exports and consumption of wool in the United States is given in the following table:

IMPORTS, EXPORTS AND CONSUMPTION OF WOOL IN THE UNITED STATES.

Year ending June 30.	Exports of domestic. Pounds.	Domestic retained for consumption. Pounds.	Imports. Pounds.	Exports of foreign. Pounds.	Foreign retained for consumption. Pounds.	Total consumption, domestic and foreign. Pounds.	Per cent of consumption, foreign.
1890.....	191,551	232,308,449	128,181,747	3,648,580	121,465,227	254,791,676	24.9
1891.....	71,455	239,928,545	55,964,286	5,507,531	54,456,702	290,385,247	17.3
1892.....	118,179	271,843,821	67,861,744	3,931,896	61,793,640	333,637,461	19.0
1893.....	64,474	289,985,586	70,575,478	4,010,048	64,585,526	354,500,961	18.7
1894.....	10,343	299,939,607	78,350,651	2,304,701	76,045,950	375,985,557	20.6
1895.....	86,006	307,911,984	70,590,170	2,115,339	68,474,831	375,392,625	18.0
1896.....	146,428	301,853,577	129,084,058	6,534,426	122,618,482	424,404,109	28.9
1897.....	267,940	294,742,080	114,098,080	6,728,292	107,826,374	392,651,798	27.4
1898.....	32,164	298,977,896	112,558,753	4,356,731	107,915,022	378,171,658	28.9
1899.....	141,576	284,858,424	126,487,729	3,283,094	122,770,823	388,083,059	31.8
1900.....	381,042	275,768,859	105,431,285	3,298,467	107,729,751	377,011,778	27.0
1901.....	291,922	284,708,076	122,203,648	2,639,128	124,842,776	411,376,603	30.8
1902.....	308,456	298,797,544	146,670,662	3,007,568	149,678,230	439,466,632	35.1
1903.....	91,868	303,061,142	172,483,838	4,218,637	167,692,475	471,276,643	35.7
1904.....	529,947	297,537,187	55,152,585	5,977,407	61,130,000	348,712,515	14.9
1905.....	4,279,109	305,468,891	306,089,908	3,343,081	309,432,885	606,156,716	40.0
1906.....	6,945,981	265,528,727	220,911,473	6,088,236	226,999,717	490,411,964	49.0
1907.....	5,871,225	253,932,076	250,952,086	3,487,394	254,439,480	500,369,508	57.8

Exports of manufactures of wool for the ten months ending October 31, 1897 and 1898, were as follows:

	1897.		1898.	
	Quantities.	Values.	Quantities.	Values.
Manufactures of wool:				
Carpets, yards.....	243,658	\$191,153	105,409	\$ 90,120
Dress goods, do.....	*31,480	13,580	50,887	29,281
Flannels and blankets.....	.....	44,558	.....	44,608
Wearing apparel.....	.....	350,389	.....	383,555
All other manufactures of.....	.....	308,677	.....	331,610
Total manufactures.....	.....	\$908,307	.....	\$879,174

* Not stated separately prior to July, 1897.

The imports of wool and manufactures of wool for the ten months of 1898 ending with October 31 and the corresponding period of 1897 are given in the following table:

ARTICLES AND COUNTRIES.	1897.		1898.	
	Quantities.	Values.	Quantities.	Values.
Wool, hair of the camel, goat, alpaca, and manu- factures of:				
Unmanufactured (pounds)				
Class 1—clothing: In the grease.....free....	170,105,868	\$26,992,826	.....	.....
Do.....dut.....	4,053,832	664,826	26,671,473	\$4,569,122
Scoured.....free....	22,270,798	5,912,530	.....	.....
Do.....dut.....	86,065	21,571	9,781	895
Class 2—combing: In the grease.....free....	36,194,954	6,793,512	.....	.....
Do.....dut.....	443,369	81,475	993,451	234,720
Scoured.....free....	248,304	53,936	.....	.....
Class 3—carpet: In the grease.....free....	84,485,027	8,840,234	.....	.....
Do.....dut.....	9,518,163	968,525	60,747,863	5,616,214
Scoured.....free....	1,255,710	138,447	.....	.....
Do.....dut.....	.....	.....	794	147
Total.....free....	314,560,661	\$48,730,985	.....	.....
Total.....dut.....	14,100,929	1,736,397	68,423,354	\$10,421,168
Manufactures of wool:				
Carbonized (pounds).....dut.....	43,726	13,513	.....	.....
Carpets and carpeting (square yards).....dut....	381,837	803,471	582,077	1,708,018
Clothing, etc., except shawls and knit fabrics dut.....	.....	801,809	.....	731,939
Cloths (pounds).....dut.....	21,823,265	13,199,831	3,703,263	3,477,010
Dress goods, women's and children's (square yards).....dut.....	60,926,606	12,857,767	29,602,739	6,183,214
Knit fabrics.....dut.....	.....	1,462,106	.....	580,510
Rags, noils and wastes (pounds).....free....	38,011,004	4,483,146	.....	.....
Shoddy, mungo, flocks, etc. (pounds).....dut....	6,374,850	1,285,846	436,110	86,098
Shawls.....dut.....	.....	257,521	.....	48,726
Yarns (pounds).....dut.....	1,529,329	783,904	249,413	147,726
All other.....dut.....	.....	2,160,567	.....	566,051
Total manufactures.....	.....	\$38,763,981	.....	\$12,592,287

The stocks of wool in the three principal wool centres of the United States for the calendar years 1897 and 1898 are as follows:

BOSTON.			
	Pounds in 1898.	Pounds in 1897.	
Domestic.....	63,608,558	94,342,078	
Foreign.....	38,391,634	32,468,418	
Total.....	102,000,192	126,710,496	
In bond.....	34,088,031		
NEW YORK.			
	Pounds in 1898.	Pounds in 1897.	
Domestic.....	12,659,619	5,729,300	
Foreign.....	8,818,345	6,140,000	
Total.....	21,477,964	11,869,300	
In bond.....	22,044,415		
PHILADELPHIA (on Dec. 24).			
	Pounds in 1898.	Pounds in 1897.	
Domestic.....	14,434,000	9,787,500	
Foreign.....	6,659,300	10,387,000	
Total.....	21,093,300	20,174,500	
In bond.....	8,491,390		

Stock in the three principal markets :

	Pounds in 1896.	Pounds in 1897.	Pounds in 1898.
Domestic.....	116,445,288	109,758,878	90,702,177
Foreign.....	28,386,500	48,995,418	53,869,269
Total.....	144,831,788	158,754,296	144,571,446

Deducting the stock held in the wool centres, as shown above (144,571,446), from the total supply, and there remains 134,738,751 lbs., which is distributed throughout the country. The year previous the country holdings amounted to only 70,000,000 lbs., only a trifle more than one-half the present country holdings.

The world's production of wool in 1897, as estimated by S. N. D. North, is given by countries in the following table, which is taken from the *Commercial Year Book*, 1898:

THE WORLD'S PRODUCTION OF WOOL IN 1897.

Europe :	Pounds.	South America (continued) :	Pounds.
Great Britain and Ireland.....	138,657,440	All other	20,000,000
Russia, including Poland.....	330,000,000		444,000,000
France.....	103,610,000	Central America.....	5,000,000
Spain.....	102,600,000	Asia :	
Germany	54,358,500	Russia.....	60,000,000
Austria-Hungary	64,300,000	British India.....	85,000,000
Italy.....	29,000,000	Asiatic Turkey... ..	39,000,000
Portugal.....	18,410,000	Central Asia	46,000,000
Sweden and Norway.....	8,200,000	China.....	30,000,000
Turkey in Europe, etc.....	67,500,000	All other.....	15,000,000
All other Europe	14,000,000		275,000,000
	925,635,940	Australasia.....	566,000,000
North America :		Africa :	
United States.....	259,153,251	Algiers and Tunis.....	32,200,000
British Provinces.....	12,000,000	Egypt.....	8,000,000
Mexico	5,000,000	Cape Colony, Natal, and Orange	
	276,153,251	Free State.....	97,000,000
South America :		All other.....	1,000,000
Argentine Republic.....	320,000,000		133,200,000
Chili	7,500,000	Oceania	50,000
Brazil.....	1,500,000		
Uruguay.	80,000,000	Total.....	2,625,039,191
Venezuela	15,000,000		

"The above table must not be held to represent an actual increase in the wool supply of the world between 1896 and 1897, such as appears from the figures. The apparent increase is due to later and more definite information regarding certain countries, notably Russia, which leads to the conclusion that its wool clip has heretofore been largely underestimated. The short clip of Australasia in 1897 is somewhat offset by the increased supplies from the River Plate, and the fair conclusion is that there is no great variation in the wool production of 1896 and 1897, the available supply of fine wools being doubtless considerably less in the latter year."

During the year there were built 53 new woollen mills and 71 new knitting mills.

WRIGHT IRRIGATION DISTRICTS. See IRRIGATION.

WYOMING, a northwestern State of the United States, with an area of 97,890 square miles. Capital, Cheyenne.

Mineralogy.—The most valuable economic production is coal, which in 1897 had an output of 2,597,886 short tons, spot value, \$3,136,694. This output was not only the first recovery from a steadily decreasing tendency since 1892, but it was an increase of nearly 12 per cent. over the total of the previous year, and the largest on local record. In all, 28 mines were worked, of which Sweetwater county had 8, which yielded 1,047,042 tons. The coking industry had 74 ovens, which produced 24,007 short tons of coke, value, \$72,021; quarrying yielded sandstone to the value of \$11,275, and petroleum had an output of 3,650 barrels, value, \$29,200. Gold mining, with a product worth \$11,200, showed a slight decline. During the winter of 1897-98 the new gold and copper mining district of Grand Encampment, in the lower part of Carbon county, began to attract widespread attention. Mining experts pronounced the surface indications richer than those of Leadville or Cripple Creek. The State geologist, Prof. Wilbur C. Knight, of the State university, found an average of \$461.82 per ton in 10 assays of ore from different parts of the district. Long stretches of rich placers were found along Grand Encampment river, and these, as well as the best of other locations, were speedily taken by expert miners. Gold, silver, copper and zinc are found in the district, each promising handsome results of development.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1898: corn, 39,632 bushels, value, \$21,798; wheat, 524,623, \$361,990; oats, 414,398, \$165,759; potatoes, 415,080, \$269,802; and hay, 484,585 tons, \$2,819,-

052—total value, \$3,638,311. Live stock comprised, horses, 72,258; mules, 1,514; milch cows, 18,140; other cattle, 694,973; sheep, 2,328,025; and swine, 22,345—total head, 3,137,255.

Banks.—On October 31, 1898, there were 11 national banks in operation and 4 in liquidation. The active capital aggregated \$860,000; circulation, \$172,402; deposits, \$2,732,143; reserve, \$943,236. The State banks, July 14, 1898, numbered 5, and had capital, \$72,000; deposits, \$250,120; resources, \$345,699; private banks, 10, with capital, \$173,517; deposits, \$825,376; resources, \$1,022,756.

Education.—The last report available at the time of writing was for 1896, and showed public school enrollment, 11,582; average daily attendance, about 7,700; public school-houses, 306; teachers, 465; value of public school property, \$428,706, and expenditures, \$211,335, including \$153,269 for teachers' salaries. For higher education there were 2 public high schools, a private secondary school, a State university, with 14 professors and instructors, 112 students and \$45,873 income; and an agricultural and mechanical college connected with the university as a department. The higher institutions had a total of 8,280 volumes in their libraries. In 1898 periodicals numbered 41, principally weeklies.

Finances.—The assessed valuations for 1898 aggregated \$30,789,291, the highest since 1893, and the total debt, February 1, 1898, was \$320,000, all bonded.

Population.—As estimated by Federal officials, the population on June 30, 1898, was about 90,000. Local estimates gave Rock Springs, 5,000; Rawlins, 3,000.

Political.—A Republican Governor was elected, with a plurality of 1,394 votes. Altogether he received 10,383 votes. F. W. Mondell was elected to Congress, with a plurality of 2,296 votes. The Democrats made no declaration of policy. The Republicans reaffirmed the principles adopted by the eleventh national Republican convention at St. Louis in June, 1896: "Protection and reciprocity, twin measures of Republican policy, have been re-established and have been embodied into law by the passage of the Dingley act, and we especially congratulate the people of Wyoming upon the enactment of this law, which has directly benefited our two great industries, viz., the raising of live stock and the mining of coal, and which both directly and indirectly has brought prosperity to every business within our State." This was voiced by the convention, which also approved the Republican party's course regarding the Spanish war and heartily approved of the annexation of the Hawaiian islands.

National Representatives and State Officers.—Wyoming's Representative to Congress is F. W. Mondell (Rep.), from Newcastle. Senators, Francis E. Warren (Rep.), Cheyenne, and another Republican. Officials: De Forest Richards, Governor; F. Chatterton, Secretary; G. E. Abbott, Treasurer; Leroy Grant, Auditor; J. A. Van Orsdel, Attorney-General; T. F. Tynan, Superintendent of Education. All are Republicans. Chief Justice, C. N. Potter (Rep.); Associates, Samuel T. Corn (Dem.) and Jesse Knight (Rep.). Clerk, R. C. Morris. There are 10 Democrats and 47 Republicans in the State legislature.

XENON. Experiments with liquid air and low temperatures resulted in the discovery by Professor W. Ramsay and Dr. Morris Travers of a new element, separated from air and argon by liquefaction and subsequent distillation, which they term Xenon. Its spectrum resembles that of argon in general appearance, while it furnishes different lines. See NEON, KRYPTON and METARGON.

X RAYS. See BOTANY (paragraph Plant Physiology) and PHYSICS (paragraph Roentgen Rays).

YACHTING. Owing to the war with Spain yachting was not as actively carried on in the year 1898 as in the years just preceding. The annual cruise and regatta were given up by the New York Yacht Club both on account of the closing up of the harbors by submarine mines and on account of the large number of yachts which were taken by the Government as auxiliary vessels. The most important yachting event of the year was the Royal Ulster Yacht Club's challenge to the New York Yacht Club for a series of races for the America's Cup. The name of the challenger was the "Shamrock," owned by Sir Thomas Lipton, and the event created a good deal of interest, since this was the first challenge received for an international yacht race since the one which had been sent by Lord Dunraven. The time appointed for the three races was October 2, 4 and 6, 1899, and they were to be run off Sandy Hook over a 30-mile course.

YALE UNIVERSITY, at New Haven, Connecticut, congregational and co-educational in the graduate courses; chartered in 1701; in 1898 had 262 officers of instruction and 2,511 students, besides 163 in the course for teachers; there were 260,000 volumes, besides many thousands of unbound pamphlets, in the library. In the year 1898-99 a number of courses for teachers were given, including psychology and pedagogy, social science, history, English, Biblical literature, botany and biology. President, Rev. Timothy Dwight, LL.D. (q. v.), who tendered his resignation in

November, 1898, to take effect at the close of the academic year. Besides the academical department, or Yale College, there is the graduate school, the Sheffield Scientific School, the department of music, the art school, divinity school, medical school and law school. Degrees conferred in 1898 were: B.A., 288; Ph.B., 115; LL.B., 27; B.D., 26; B.F.A., 4; M.A., 13; LL.M., 15; C.E., 2; M.E., 1; M.D., 31; Ph.D., 34. Honorary degrees: D.D., 4; LL.D., 3; L.H.D., 1; M.A., 6. President McKinley was one of those who received LL.D. The course of instruction in the college occupies four years and in the Scientific School three years. See PSYCHOLOGY, EXPERIMENTAL, and UNIVERSITIES AND COLLEGES.

YEAST. See BOTANY (paragraphs Cyclopedia and Plant Physiology).

YELLOW FEVER. In the opinion of Dr. A. H. Doty, Health Officer of the port of New York, Havana is the only great menace to the public health of the United States which exists. He says that it has undoubtedly been the cause, directly or indirectly, of almost all the outbreaks of yellow fever in this country for an indefinite period. The close proximity of Havana to the United States increases its dangers, inasmuch as persons coming from this city can reach our shores long before the expiration of the period of incubation of yellow fever (from one day to two weeks). It has been accepted by scientists and investigators who have pursued their researches or published their results during 1898 (Licéaga, of Mexico; Pothier, of New Orleans, and others) that the cause of this disease is the bacillus icteroides, discovered by J. Sanarelli, of Montevideo, and first described by him in a contribution to *Annales de l'Institut Pasteur* in June, 1895. His later researches, published in the same periodical in September, 1897, show that yellow fever is eminently a toxic disease, induced by a poison generated by the bacillus icteroides, to which he has given the name "amaril." This specific bacillus has little resistive power against moist heat, but resists dry heat at 100° C. for over an hour, and requires a temperature of between 120° and 125° C. to kill it. It strongly resists drying. Sunlight causes its death in about 7 hours. Mould aids the growth of the bacillus. Under certain conditions which would appear to be particularly liable to be produced on shipboard, dampness, heat, darkness and absence of ventilation, it may be called into activity when otherwise unable to flourish, a fact which may account for the manner in which infection has clung to ships, springing into activity at irregular intervals. Sanarelli has demonstrated that animals may be infected through the respiratory tract, which may be the path of infection in human beings. Infection through the digestive tract lacks sufficient evidence; but many who acquire yellow fever have previously suffered from digestive disturbances, which suggests that a weakened or ulcerated mucous lining to the alimentary tract may offer entrance to the bacillus, if swallowed in polluted water, for example. C. B. Fitzpatrick, of the New York Health Department, found two bacilli accompanying the bacillus icteroides in cases he investigated. To these he gave the names bacillus coli icteroides and bacillus coli concentricus. Inoculations with attenuated cultures of any of the three forms of bacilli he found will produce immunity to lethal doses of pure cultures; and also inoculations of cultures in which two or three of these bacilli were mixed will also produce immunity to the virulent mixed cultures. He states his belief that a serum can be produced which will antagonize yellow fever and afford immunization. Sanarelli found that serum taken from the blood of patients who had died of yellow fever had no preventive power against the bacillus icteroides, while serum taken from a convalescent had slight protective power. From horses and oxen inoculated with virulent toxin, he has obtained an antoxic serum, with which he inoculated several patients with varying success, as recorded in *Dublin Journ. of Med. Sci.* for June, 1898. No new cases appeared among the inmates of a prison which became infected with yellow fever after Sanarelli inoculated them with his antitoxic serum. See PUBLIC HEALTH and SERUM THERAPY.

YOUNG MEN'S CHRISTIAN ASSOCIATION consists of 6,415 associations scattered throughout the world, with a membership of 511,200. This includes the 1,328 associations in the United States. The total membership of these American bodies is 237,976, with 1,211 general secretaries and paid officials; 333 buildings valued at \$18,575,350, 704 libraries with 493,736 volumes and a total net property of \$18,181,020. The office of the International Committee is 3 West Twenty-ninth Street, New York. The latter is the general executive of the American associations, and consists of 45 Christian laymen and 45 secretaries. Officers are: Chairman, Lucien C. Warner; Treasurer, Frederick B. Schenck, and General Secretary, Richard C. Morse. In Great Britain there are 1,249 associations, with 105,170 members. Sir George Williams, the chief founder of the movement, is the president. Headquarters, Exeter Hall, London. Secretaries are: John H. Putterill and Clarence Hooper. The Central International Committee consists of members from America, Australia, Austria, Hungary, Belgium, Denmark, England, France, Germany, Italy, Netherlands, Norway, Russia, Spain, Sweden, Switzerland, Japan and

India. Officers are: Edouard Barde, chairman; Ernest Favre, secretary; Henry Fatio, treasurer, and Charles Fermaud and Christian Phildius, secretaries. Headquarters, 3 Général Dufour, Geneva, Switzerland.

YOUNG PEOPLE'S CHRISTIAN UNION (OF THE UNITED BRETHREN IN CHRIST), organized in 1890, a union of young people's church societies, now consists of 1,971 bodies, with a membership of 80,243. The union has built a mission in Los Angeles, California, costing \$7,000, and is now building a church in Chicago. Its fourth biennial convention was held in Toledo, Ohio, June 16-19, 1898. The *Watchword* is its organ. President, Prof. J. P. Landis, Dayton, Ohio.

YOUNG WOMEN'S CHRISTIAN ASSOCIATION, similar in purpose to the Y. M. C. A., was founded in 1886. The work is fourfold—physical, consisting of gymnasium, excursions, outing clubs, etc.; educational, lectures, concerts, music and art clubs, etc.; social, receptions, entertainments, etc.; and religious, Bible classes, Gospel meetings, evangelical meetings, etc. General office, 1004 Champlain Building, 126 State St., Chicago, Illinois. Chairman, Mrs. H. C. Tillman; Vice-Chairman, Mrs. C. M. Howe. Membership of the American associations, 35,000; number of associations, 377. Twenty-one States have organized State associations, each one of which holds an annual convention. Every year three summer schools are held for the training of young women in evangelical work. October 2 is set apart as a day of prayer. College women manage a separate department. The organ is *The Evangel*, published monthly in Chicago. Great Britain has 1,340 Young Women's Christian Associations; France, 270; Germany, 400; Denmark, 400; Sweden, 42; Norway, 16; Italy, 17; India, 65; South Africa, 7; Canada, 15, and Australasia, 46. The World's Y. W. C. A. was founded in 1893. Headquarters, 25 and 26 George St., Hanover Square, London; Secretaries, Hon. E. Kinnard, Miss Morley and H. Kidder.

ZACHOS, JOHN C., curator of Cooper Union Institute, New York city, died March 20, 1898. He was born in Constantinople in 1820, his parents being Athenians, and his father a general in the Greek revolutionary army. He came to America, and after his graduation from Kenyon College in 1840 studied medicine, but abandoned this for literature. In 1853 he became professor of English in Antioch College. He served in the Civil War as a surgeon, and later went to Boston, and became a Unitarian minister. In 1866 he accepted the chair of rhetoric in the Meadville (Pa.) Theological School. Removing to New York in 1871, he became curator of Cooper Union. Dr. Zachos was well known as a teacher of literature and oratory. Among his published works are: *Analytic Elocution*, *The New American Speaker*, *The New Method of Teaching English*.

ZANGWILL, ISRAEL, author, was born in London in 1864. He is practically self-educated, and has taught, written novels, essays and plays, and lectured in Great Britain, Holland, Jerusalem, and, in 1898, in the United States. His publications include: *The Premier and the Painter* (1888), *The Bachelors' Club* (1891), *The Old Maids' Club* (1892), *Children of the Ghetto* (1892), *Merely Mary Ann* (1893), *Ghetto Tragedies* (1893), *The King of the Schnorrers* (1894), *The Master* (1895), *Without Prejudice* (1896) and *Dreamers of the Ghetto* (1898).

ZANZIBAR, PROTECTORATE OF. Zanzibar is an island off the coast of German East Africa, but the term is also applied to the protectorate which includes besides this island the island of Pemba, to the north, both being governed by the Sultan of Zanzibar under a British commissioner. The area of the island of Zanzibar is 625 square miles, with a population of 150,000; and of Pemba, 360 square miles, with a population of 50,000. It is an important seat of production and trade, being regarded as the entrepôt of Eastern Africa. Its principal products and exports are cloves, clove stems, copra, cocoanuts, shells, hides and goat skins; but it also exports other products which come from the African continent. There are few manufactories in Zanzibar, the chief mechanical industries being the making of ivory, ebony and silver ornaments. The foreign trade is considerable, and American petroleum and cotton goods are among the articles of import. The internal trade is also considerable. The revenues are derived from customs dues, water supply, registration, rents of government property, port dues, shipping and the post office. According to the United States Consular Report of October, 1898, they yield about \$600,000 a year, and do not as a rule fall short of the expenditures. The city of Zanzibar had a population estimated at 100,000 in 1898, comprising people of various races, including, besides the natives, Arabs, English, Germans, French, Italians, Portuguese, Hindoos and a few Americans. For the year ending June 30, 1898, the tonnage of ocean vessels clearing at the port of Zanzibar was 255,705 and of coasting vessels, 25,295. The port is virtually free, but there is a tax of 5 per cent. ad valorem on spirituous liquors, firearms and ammunition, opium, tobacco, rice and grain. The natives, both of Zanzibar and Pemba, are Swahillis, who constitute the laboring class, but the Arabs are the ruling class. The Swahillis are said to be a peaceable, indolent people, but quick to learn

and loyal to the government. The Sultan of Zanzibar formerly ruled not only the islands, but a large tract extending along the coast and into the interior for an indefinite distance. Treaties with Great Britain and Germany restricted the area of his continental territories, and finally only the islands of Zanzibar and Pemba were left under his direct administration. The present Sultan, Hamoud bin Mahomed, was chosen by the British to succeed the previous Sultan, who died in 1896. The British exercise general control, having organized a regular government for Zanzibar in 1891. An Englishman is the prime minister of the Sultan, and there is a British agent, who, since 1892, has held certain judicial authority, having the right to try all cases in which British subjects are involved, and having admiralty jurisdiction in regard to the slave trade. The accounts of the Government must be always open to the inspection of the English representative, and no public expenditure can be undertaken without his consent. Although the British upon their control abolished the legal status of slavery, it is estimated that about 280,000 persons are still, technically speaking, slaves. The officials hesitate to enforce their emancipation until steps have been taken to provide them with the means of earning a livelihood as laborers. It is said, however, that slaves there are not in a similar situation to that in which slaves ordinarily are found, for they have their own houses and the tenure of their bondage is fixed. They cannot be sold by their masters or transported to a different place, or separated from their wives and families. The bestowal of liberty upon them would, it is urged, be a curse rather than a blessing under existing conditions. In 1898 the British agent and consul-general was Sir Arthur H. Hardinge, the commissioner of British East Africa.

ZINC. The United States production for the last ten years, including 1898, was:

	Quantity. Short tons.	Value at New York city.		Quantity. Short tons.	Value at New York city.
1888	55,903	\$5,500,855	1894	75,328	\$5,288,026
1889	58,860	5,791,824	1895	89,686	6,278,020
1890	63,683	6,266,407	1896	81,499	6,519,920
1891	80,873	8,033,700	1897	100,387	8,271,889
1892	87,260	8,027,920	1898	112,334	10,267,327
1893	78,832	6,306,560			

In 1898 the product supplied not only the domestic market, but was also exported. The important producing regions in the United States at present are Sussex county, New Jersey, the Missouri, Kansas, area, of which Joplin is the centre, while the Iowa and Wisconsin regions are of lesser importance. The Virginia mines are becoming exhausted, and the zinc oxide works in that region are beginning to draw on other States for their supply.

ZOLA, EMILE. See FRANCE and FRENCH LITERATURE (paragraph Fiction). •

ZOOGEOGRAPHY. See DISTRIBUTION OF ANIMALS.

ZOOLOGICAL LITERATURE. It is hard for any person not interested in the subject to form any idea of the large amount of printed matter which is called into existence by the studies and speculations of zoologists alone. During 1898, the amount of literature has certainly not been less than usual and it is probably greater than ever before. The *Zoologischer Anzeiger* in the 28 numbers issued during the year records no less than 8,300 titles of papers, pamphlets and books dealing with zoology. Of course it is not possible here to enter into any discussion of this mass of literature, but a few of the more important works may be briefly mentioned.

General Biology.—Under this head, Mr. Spencer's revised edition of his *Principles of Biology* is doubtless the most important work of the year, giving, as it does, the very latest news of this profound thinker, on the problems of life. Several other books bearing on the general problems of biology have attracted some attention, including one by the Duke of Argyll maintaining his well-known attitude of hostility to Darwinism, but admitting the probability of certain forms of evolution. Another well-known opponent of Darwinism, Dr. St. George Mivart, has published his views on the philosophy of biology in a book called *The Groundwork of Science*. Professor J. W. Powell, the anthropologist, has aroused no little interest by his book entitled *Truth and Error*, in which he sets forth a complicated and in some respects novel philosophy.

Text-books.—A considerable number of text-books and laboratory guides have appeared, and several are of notable importance. In Germany, doubtless the most important of these is Gegenbaur's *Comparative Anatomy of Vertebrates*, the first volume of which was published late in the year. In this book of nearly one thousand pages, the famous German anatomist deals with the skin, skeleton, muscles, nervous system and sense-organs of vertebrates. The work shows all the ability and power

that would be expected from such a master of comparative anatomy, but is somewhat too much inclined to oppose and underestimate the value of embryological research. Another German work of note is Professor Kollmann's *Text-book of Human Embryology*, a book of 658 pages, well arranged and with good illustrations. A less important work, but one of considerable interest and real value, is also a German publication, Selenka's *Zoological Pocket Handbook*, the fourth edition of which has appeared in two volumes with over 800 illustrations. Parker and Haswell's *Text-book of Zoology*, although dated 1897, really was not on the market until 1898, and is such an admirable work that it cannot be ignored here. The illustrations are as a rule superb and the text is always clear and comprehensible. The more the book is used, the more favor it is sure to find in the eyes of students and teachers alike. Its failure to cite authorities is doubtless a very serious blemish, but it is not one that is likely to cause students any inconvenience. Another admirable *Text-book of Zoology* which has appeared during 1898 is Professor Sedgwick's. One volume has been issued which deals with all the Invertebrates except Arthropods and Echinoderms, which are to be considered in a second volume along with the Vertebrates. This book is the outgrowth of Professor Sedgwick's plan to revise his well-known translation of Claus' German text-book. It is very well illustrated and the text is simple, well written and clear. Mr. F. E. Beddard, the well-known prosector of the Zoological Society of London, has issued a small book of some 200 pages called *Elementary Practical Zoology*, but considering the high standing of its author as a comparative anatomist, it is a disappointment and is by no means a fair illustration of his best work.

Entomology.—Professor Packard's *Text-book of Entomology*, which appeared in the fall, though dealing with a restricted field, is really one of the important books of the year. Insects are here treated of in the fullest detail, their anatomy, embryology, habits, distribution, economic importance, etc., being recounted with the skill and attractiveness which would be expected from so well known an entomologist. A more popular book on insects and one notable on account of its many excellent plates, produced by a new process, as well as for its very interesting text, is Dr. W. J. Holland's *Butterfly Book*, an account of the day-flying Lepidoptera of the United States. One of the most remarkable books on insects is the account of the *Instincts and Habits of the Solitary Wasps*, by George W. and Elizabeth G. Peckham, a fascinating volume of 250 pages and illustrated with 14 plates. It recounts in the most interesting manner the authors' observations on these peculiar insects, and it cannot fail to hold the attention of any one interested in natural history.

Popular Zoology.—Two books of a popular character, but containing a great deal of good scientific information, are Mrs. Mabel Osgood Wright's *Four-footed Americans and their Kin* and Ernest Seton Thompson's *Wild Animals I have Known*. The former is a book of 430 pages, admirably illustrated, dealing with the life histories of 75 species of quadrupeds, and thus forming a sort of companion book to *Citizen Bird*, published by the same author last year. Mr. Thompson's book is somewhat smaller, but more profusely illustrated, and deals more particularly with individual birds and mammals, which through some peculiarity were easily recognized, and thus became for a greater or less length of time friends of the author. It is a sad commentary on animal life that nearly all of these friends finally suffered a tragic death. Somewhat less popular and of great scientific value are the four new volumes of the Cambridge Natural History brought out in 1898, including *Birds*, *Insects*, *Mollusks* and *Worms*.

Systematic Zoology.—The works on systematic zoology have been legion, and only two or three of the really important ones can be mentioned. Undoubtedly the leader of these is the *Tailless Batrachians of Europe*, by Mr. G. A. Boulenger, published by the Ray Society of London. The first volume, of 200 pages, appeared near the close of 1897, and the second volume, of 130 pages, with 44 figures, 4 maps and 14 plates, 10 of which are colored, has been published during the past summer. The whole work is first class in all particulars and calls for nothing but commendation. Parts four and five of Trouessart's *Catalogue of Mammals, Living and Fossil*, consisting of 600 pages of text, have appeared during 1898, and part four of Jordan and Gilbert's *Fishes of North and Middle America*, with more than 900 pages, has also been published. The first part (120 pages) of the *Zoological Results* of Dr. Arthur Willey's expedition to "New Guinea, New Britain, the Loyalty Islands and elsewhere," has appeared, and parts two and three were to follow directly. One of the most notable monographs of the year, aside from its great scientific value and the attractiveness of the group with which it deals, is entitled *The Cubomedusae*. The author was the late lamented Dr. Franklin Story Conant, Bruce Fellow at the Johns Hopkins University, and this is a memorial volume published by his friends there. It comprises his investigations on the two new Cubomedusæ which he discovered in Jamaica in 1896, and is an exceptionally valuable piece of work. For other systematic works see ORNITHOLOGY (paragraph Literature).

ZOOLOGICAL SOCIETIES. The year 1898 has been a memorable one for organizations of zoologists on account of the International Congress at Cambridge, England, the very successful meeting of the British Association at Bristol, and the anniversary meeting of the American Association at Boston. But there have been many other gatherings of zoologists in the four quarters of the earth which have all worked toward the promotion of the science. Early in January the Australasian Association for the Advancement of Science met at Sydney and enjoyed a markedly successful session. Six hundred members were present and 269 papers were read. In the section of Biology, Professor C. J. Martin delivered the presidential address on the "Growth of the Science of Morphology and its relation to Physiology." In April the New York Academy of Sciences gave its annual exhibition of the year's progress in science. The exhibition in zoology, though not very extensive, was extremely interesting, as there was a fine exhibit of Mr. Crampton's remarkable work in "grafting" moths, besides collections of specimens made by the summer laboratories of New York University in Bermuda and Columbia at Puget Sound. In May the Royal Society of London held its annual converzatione, but the exhibits in zoology were small. In June the German Zoological Society held a very successful meeting at Heidelberg. The New York Zoological Society enjoyed a good year, and the prospects of opening the Zoological Park at an early date were excellent. Several of the buildings are already finished and others are in a fair way toward completion. Early in the year the scientific societies of Washington formed an organization to be known as the Washington Academy of Sciences. The Biological and Entomological societies are both included. The most important of the meetings of zoological societies in England and America during the last half of the year, were as follows:

American Association for the Advancement of Science: Section F, Zoology.—The fiftieth anniversary of the foundation of the American Association was celebrated at Boston, August 20-27, by one of the most successful meetings ever held. There were over 900 members in attendance, representing 36 States and 6 foreign countries. Of the 443 papers considered, 38 were presented in Section F, Zoology. Of these, 10 dealt with entomology, 8 with palæontology and 8 with vertebrates. The most notable paper very naturally was the vice-presidential address of Professor Packard, who discussed at length, "A Half Century of Evolution, with special reference to the Effect of Geological Changes in Animal Life." Another very interesting paper was Professor Hyatt's account of the "Evolution and Migration of Hawaiian Land Shells," based on the study of 22,000 shells. Other noteworthy papers were Professor J. B. Smith's "Notes on the Habits of some Burrowing Bees," Dr. L. O. Howard's "The Proposed Attempt to introduce *Blastophaga psenes* into California," and Professor Gage's reports on the lamprey and toad.

International Congress of Zoologists.—Beyond question the most notable gathering of zoologists during the year 1898 was the fourth international congress held at Cambridge, England, August 23-26. There were 300 members present, representing France, Germany, Russia, Holland, Italy, Spain, Japan and the United States, besides England and her colonies. The most important features of the proceedings were two discussions, one on the position of the Sponges in the Animal Kingdom, the other on the origin of the Mammalia. The former topic was opened by M. Ives Delage, who regarded the Sponges as separate from the Cœlenterata, an early offshoot of the main Cœlenterate branch. Mr. Minchin, of Oxford, favored the independent descent of the Sponges from the Choanoflagellate Protozoa. Professor Hæckel defended their Cœlenterate origin, Mr. Saville Kent favored the Choanoflagellate theory, while Professor Schulze upheld the Cœlenterate view. The discussion on the origin of the mammalia was opened by Professor Seeley, who admitted the resemblances to Anomodont reptiles, but regarded the two groups as descendants of a common ancestor. Professor Osborn, of Columbia, supported Professor Seeley's main points, but believed that a third as yet undiscovered group of Anomodont reptiles would prove to be the common ancestor of both lines. Professor Marsh, of Yale, doubted whether the distinctions between reptiles and mammals were quite done away with yet, and did not believe the ancestor of mammals would be found among the huge Anomodonts. Professor Hæckel favored the view of a single common marsupial ancestor for all groups of mammals. Professor Sedgwick did not think that either embryology or palæontology would solve the problem. Professor Hubrecht opposed the view of a common marsupial ancestor and predicted that the future would see a great contest over the question whether mammals were descended from oviparous ancestors. For the reception of special papers the Congress divided into four sections: (A) General zoology, (B) Vertebrates, (C) Invertebrates except Arthropods, and (D) Arthropods. In these sections numerous important and interesting papers were read, of which only a few can be mentioned here. Professor Hæckel discussed the "Descent of Man" and Professor MacBride the "Origin of Echinoderms." Professor Plate gave an ac-

count of the "Comparative Anatomy of the Chitons" and Mr. Piepers of the "Evolution of Color in Lepidoptera." Mr. Graham Kerr described the habits and development of *Lepidosireia* and exhibited a splendid collection of the specimens he secured in Paraguay. Professor Ewart gave a most interesting account of his experiments in crossing mares with a zebra stallion and the evidence it afforded in support of the theory of telegony, and Professor Hubrecht's paper on the "Origin of the Red Blood Corpuscles in the Placenta of *Tarsius*" shed a ray of light on the possible explanation of that curious theory. The Congress adjourned to meet in Germany in 1901.

British Association for the Advancement of Science. Section D, Zoology.—The meeting of the British Association was held at Bristol, England, August 7-14, and was attended by nearly 2,500 members. The section of zoology was not so well attended nor were there as many papers presented as had been expected, very few of the foreign visitors to the Congress of Zoologists, the week before, staying on, as it was hoped they would. The address of the president, Professor W. F. R. Weldon, was a masterly discussion of some of the principal objections urged against the theory of natural selection. He showed that the law of chance enables one to express easily the frequency of variations among animals; that the action of natural selection upon such fortuitous variations can be experimentally measured; and that the process of evolution is sometimes so rapid it can be observed in the space of a few years. The statistics offered, based on a series of crabs collected at a given place during a series of years, afforded the most interesting evidence possible in support of his views. Other noteworthy papers at this meeting were as follows: Mr. W. Garstang's "Races and Migrations of the Mackerel" (see ZOOLOGICAL STATIONS, paragraph Foreign Stations); Dr. Arthur Willey's "The Phylogeny of the Arthropod Amnion"; Dr. H. L. Jameson's "A Race of Protectively Colored Mice"; Professor Julius' "The Development of the Heart in Tunicates"; Dr. A. J. Harrison's "The So-called Fascination of Snakes"; Professor Lloyd Morgan's "Animal Intelligence"; and Professor Poulton's and Miss Sander's "An Experimental Inquiry into the Struggle for Existence in Certain Common Insects."

The American Society of Naturalists: American Morphological Society.—The "Naturalists' Meeting" was held in New York at Columbia University, December 28-30, 1898. The principal discussion was regarding "Advances in Methods of Teaching." Zoology was represented by Professor E. G. Conklin. He advocated the promotion of research in all colleges and the establishment of closer relations between teaching and research, and at the same time increased facilities for the study of living animals, especially by means of *vivaria* or animal houses. The meetings of the Morphological Society were well attended, and many of the 42 papers on the program were of unusual interest. Three of the best papers dealt with fishes. Mr. C. H. Eigenmann's account of his investigations on blind fishes seems to prove that the fishes of our cave-fauna are not blind because they live in caves, but they live in caves because they are blind, i.e., they became blind outside and moved in! Mr. Dahlgren has discovered valves on the roof and floor of the mouth in Teleosts, which seem to have been overlooked hitherto. Mr. N. R. Harrington gave an account of the development of the lungs of *Polypertus*. (See ZOOLOGICAL STATIONS, paragraph Seuff Expedition.) Of the other papers, those especially noteworthy were Dr. Bumpus' account of a "Specific Case of the Elimination of the Unfit," telling of 163 English sparrows overcome by the blizzard in November, and with but a single exception the ones which perished were those which departed farthest from the golden mean in size, weight, etc.; Professor Conklin's proof that protoplasmic flow strongly influences, if it does not control, the unequal segmentation of the egg in *Crepidula*; and Professor Verill's account of "Variations and Monstrosities in the Common Starfish." Mr. A. G. Mayer's pictures of an Atlantic Palolo-worm, and others illustrating the habits of the Florida turtles were very much enjoyed. See also ORNITHOLOGY (paragraph Organizations).

ZOOLOGICAL STATIONS. Perhaps there is no better evidence of the increasing public interest in zoology and the recognition of the necessity of biological stations than the progress made during 1898 in the establishment of new stations and the support given to those already established.

Foreign Stations.—All of the European stations report a year of general success and progress. The stations at Naples, Trieste, Concarneau, Roscoff and other continental points have had their full share of students, including many Americans. Thanks to the great courtesy and kindness of Dr. Dohrn, three Americans have been accommodated at Naples at the Smithsonian table at one time, although one at a time is supposed to be the rule. The St. Petersburg Society of Naturalists has just established a permanent fresh-water station on Lake Bologoye, a body of water said to be peculiarly well adapted to the requirements of such a station. The Marine Biological Stations at Port Erin, Isle of Man, and at Plymouth, England, have been well filled with students and investigators, and have enjoyed a very successful year. It was at

the latter station that Mr. W. Garstang made his interesting and highly important discoveries in regard to the mackerel. These seem to show that the mackerel is not a wide-ranging fish, but is so much restricted in its wanderings that specimens from the northern coast of France are easily recognizable from those taken on the west coast of Ireland, and both differ from the American form. Several other interesting and important discoveries have marked the year at Plymouth.

American Stations.—On this side of the Atlantic one of the most important advances made has been the enlisting of the Canadian Government in the establishment of a permanent biological station on the St. Lawrence. A committee to take charge of the matter was appointed over a year ago, and has now secured a grant of £3,000 from the Government, of which £1,400 becomes available for use in the current year. The plan is to have a floating station for five years, and the prospects of a creditable establishment are exceedingly bright. The temporary equipment of marine laboratories by American colleges and universities has been more noticeable during the past summer than ever before. Tufts College had such a station on the shores of Casco Bay, which it is hoped to make permanent during the coming year. The University of Pennsylvania had a station at Sea Isle City, N. J., and the Leland-Stanford, Jr., University occupied, as in previous summers, the Hopkins laboratory at Pacific Grove, Cal. Several of the State universities of the middle west established freshwater stations on different lakes, and such stations have proved themselves of real value. The Bermuda Islands were the headquarters of two temporary stations; one in the spring from Yale University, and one in the summer from New York University, which continued the good work begun there in 1897. The Brooklyn Academy of Sciences maintained their laboratory on Long Island at Cold Spring Harbor throughout the season, and a very good biological survey of the surrounding region has been completed. The Marine Biological Association enjoyed another very successful season at Woods Holl, and in many respects the summer was exceptionally profitable. The increased activity at the Fish Commission laboratory added much to the biological population of the town, and made Woods Holl more than ever the Mecca of eastern biologists.

United States Fish Commission Laboratory.—The laboratory of the Fish Commission has been open to investigators since March, and a large number of zoologists have availed themselves of the opportunities offered them for research. Many students from Harvard, Brown, Yale and Johns Hopkins were working there through the summer, and a number of other institutions were also represented. Investigations on the nervous system of fishes and other questions of vertebrate morphology occupied a large proportion of the workers, but hardly a group of marine animals was entirely passed over. As one result of this increased activity and wide-ranging study, a great deal of information has been collected on the breeding seasons of the animals about Woods Holl. This has been put into shape by Dr. Bumpus, the director of the station, and published, so that future students in embryology will have some guide to assist them in selecting the best time of year for their work. The equipment of the laboratory has been greatly added to, and during a large part of the season the Fish Commission's schooner *Grampus* was at the service of collectors. (See DISTRIBUTION, second paragraph.) A number of fishes have been added to the fauna of Woods Holl in the last five years through the activity of the laboratory's collectors, and two more were added during the past summer. One of these, a small file fish, appears to represent a species new to science. There are now known from Woods Holl 222 species of fish, a much larger number than is known from any State in the Union except Florida. It is a curious fact that quite a number of these fish are tropical species, apparently stragglers from West Indian waters, and have not been recorded from any other place on our coast north of Florida.

The Senff Expedition.—Perhaps the most interesting zoological station established during the year was the one settled for two months of the summer at Mansourah, Egypt. "The Senff Zoological Expedition to the Nile Valley," as this party was called, was sent out under the auspices of Columbia University through the generosity of Charles H. Senff, Esq., of New York city. Leaving New York, April 23, the party, consisting of Mr. N. R. Harrington and Dr. Reid Hunt, went to Cairo via London, and thence searched the Nile for several hundred miles. They settled at Mansourah in June and remained until the last of August, finally sailing for home from Port Said on September 10. The chief object of the expedition was the collection of embryological material of *Polypterus*, a peculiar, and in some characteristics primitive, fish, abundant in some parts of the Nile. Owing to the fact that the eggs were still immature when the party was obliged to return, the embryological material was not obtained, but an excellent opportunity was given and improved for studying the fish in its native haunts and for securing an abundance of carefully prepared anatomical material. Moreover, some very fine invertebrate collections from the Red Sea and Eastern Mediterranean, and embryological material of various interesting

fishes from the Nile, were secured, so that there can be no doubt of the success and permanent scientific value of the expedition.

ZULULAND lies on the southeastern coast of Africa to the north of Natal, with an area of about 12,500 square miles and a population in 1896 estimated at 179,270 natives and 1,100 whites. The natives follow agriculture, but have not attained a high degree of skill. The mineral resources include gold, silver, lead, copper, tin, iron, asbestos and coal. Zululand is best known in connection with the war of 1879. In 1887 it was annexed by Great Britain. The country is not open to settlement for Europeans except one district, being intended as a reserve for the natives. In December, 1897, it was incorporated with Natal (q. v.).

ZYMOTIC DISEASES. See PUBLIC HEALTH.

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